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OF

GAS LIGHTING,

WATER SUPPLY,

AND

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JANUARY 1, 1861.

NOTES UPON PASSING EVENTS.

A FEW years ago, Ireland was the weak point in England's Empire—pauperism, discontent, sedition, were chronic in the green and fertile island; crimes against persons and property were so rife that the grim suggestion of Admiral Sir Isaac Coffin, "that Ireland's ills could only be cured by scuttling the island, and putting it under water for twenty-four hours," was often alluded to with as much favour as an impossible proposition of such savage barbarity could be. Times are changed for the better. In 1830, one-third of the population were paupers; in 1859, exact statistical returns gave only one pauper in thirty-two souls, and that pauper well cared for; and, if a child, well housed and taught. In 1830, the wages of an able-bodied man were 2s. 6d. a week, and for that sum there were six men seeking employ wherever one was wanted. At present, an agricultural labourer gets 7s. a week in ordinary times; and, at harvest, just what he chooses to ask, besides extra wages for draining or any kind of skilled labour. Since 1830, out of three and a half millions of reclaimable land, two millions have actually been reclaimed; the revenue has risen from four millions to seven millions; the tonnage of Irish shipping has more than doubled; and, while the cases of murder, manslaughter, and other atrocious crimes, formerly amounted to hundreds in each year, a recent return gives for the whole island in one year only five homicides. For this great advance in social prosperity, there are many causes, but one of the most powerful has been the public works in arterial drainage, in reclamation, and in means of improved conveyance by land and sea—by roads, railroads, and steamboats.

India is now what Ireland was—the land over which a dark, ominous cloud is continually hanging. There, an industrious but almost pauper, and consequently discontented, people, a heavy debt, and an insufficient revenue, are a constant source of anxiety, not only to the local governors, but to every Englishman who takes the trouble to study and consider the condition of this great Eastern Empire. The solution of the difficulties of Indian finance must be found in the development of Indian resources by works of public utility. We have said this before; it cannot be repeated too often. Lord Dalhousie, who has lately died, and to whose undoubted merits, at least, full justice has been done by the English press, saw this, and, according to his lights, did his part toward "ripping up" the Indian peninsula with railroads. But it was an unfortunate peculiarity of Lord Dalhousie's character that he desired to settle the details of every public undertaking himself; and this mania was too consistent with the traditions of Oriental Satraps not to be encouraged byhis advisers and courtiers. If a Governor-General of India were endowed with a 40-Brougham power of work, he could not get through half his political duties, if in addition, he takes it into his head to consider personally all the plans sent in for trunk roads, railroads, canals, irrigation works, &c.; it is quite certain that he will often, after accumulating mountains of reports and plans, be compelled to decide very hastily. It is well known that the project for the great Madras Irrigation Works (the most valuable reproductive innovation ever attempted), which have been the fulcrum on which similar works throughout the Indian Empire have been set in motion, would have been buried under reports and blue books before it reached the eyes of the Governor-General, if it had not been made the hobby of a Governor of Madras of powerful English aristocratic connexions, anxious to do something to immortalize his vice-royalty. Colonel Cotten, the author of the Madras plan, had been working in vain, almost against hope for years, to promote cheap reproductive works. An accident made him successful at last.

Lord Dalhousie initiated some great works, but he left behind a precedent for minute interference which all the holders of power seem prompt to imitate. We meet this mania for meddling in the details of engineering works, which would be so much better left to the responsible officers, at every turn of Indian Government.

It would seem as if we were exporting to India all our exploded political fallacies. Having abolished in England the last vestiges of fiscal protection, our official representatives have re-established protective duties, in the most offensive shape, in the Indian custom-houses. While an English traveller can import from the Continent, without paying a fraction of duty, all the clothing and all the furniture for an establishment in London, the civil or military officer returning to Calcutta from his English furlough, must pay a duty of from 5 to 10 per cent. on his wife's wardrobe and his own canteen; and so while we are decentralizing in England, India centralization daily gains power by the use of telegrams and railroads. State papers from the pen of the present Governor-General of India, recently published, show without meaning it, the miserable failure of the Indian centralization system as regards public works. Every kind of business is lost in "Minutes" and "Reports." It is the theory that everything in the way of public works must be settled and sanctioned in Calcutta: in practice, two-thirds, at least, of the business is forgotten.

Lord Canning has been making a "Progress" through part of the dominions over which he rules with absolute power; and, although we all know how little it is possible for one man, even a *Times* commissioner, to see in the course of a journey, by a happy accident he has come in contact with, some disastrous specimens of the result of the financial retrenchments of which he, or his advisers, wrote home in terms of the greatest self-satisfaction. A short time before the mutiny broke out, home agitation had created an Indian official opinion on the advantage of reproductive public works. India had previously been administered on the old Irish landlord principle of getting as much rent as possible, and leaving the tenant to execute the permanent improvements, if he would and if he could. The mutiny, of course, brought to a standstill a class of works which would soon have turned the chronic deficits in the Indian revenues into a surplus. The rude plan of economy adopted after the mutiny brought almost all the public works,

except railroads (which, fortunately, were not entirely under official control), to a standstill. Undertakings on which large sums had been sunk, but which were as valueless as telegraphic wires without the galvanic batteries needful for setting them in action, without further and comparatively small expenditure, were brought to a dead-lock by the Calcutta edict. Besides the loss of interest on the unproductive capital, there was the more serious loss from the ravages of a tropical climate —ravages particularly fatal to works of irrigation. Thus a correspondent from Arakan writes to the *Englishman* (Indian newspaper), that "the military road from Akyab to Chittagong, constructed eight years ago at a cost of £300,000, *had disappeared into a jungle* for want of repairs;" and that "£150,000 had since been laid out on it to make it *passable*."

Lord Canning, speaking of districts he visited in Upper India, says he saw "sections of road of excellent construction interrupted by other sections barely passable; tunnels half driven; bridges half built or uncommenced, though the material was deposited on the site; costly buildings left half finished; and works of irrigation for which the profitable return had been delayed for want of indispensable expenditure" —in fact, a long series of illustrations of the old story of spoiling the broth to save a halfpenny worth of salt. *On paper*, the Indian Government seemed to have effected extraordinary economies; *in fact*, they were roasting pigs by burning down houses. But although Lord Canning, as a man of common sense, was struck by the folly of leaving a reproductive work to go to ruin for want of a small per centage on the original cost, it does not seem to have occurred to him that the system of Government must be essentially false which leaves the discovery of such niggard extravagance to the chance of the Governor-General making a tour and using his eyes. Not that Lord Canning's elementary lessons on political economy are entirely without use; for there are old Indians who would lose all that has been sunk on public works sooner than establish the precedent of a loan for such a purpose. We find occasionally the same order of intellect amongst very rich men even in England. We remember an instance in which a wealthy banker, having, for the first time in his life, consented to take shares and become a director in a railroad that traversed his estate, was shocked at finding the capital of the Company, some £200,000 expended, and about £30,000 wanted to open the line. Against borrowing he set his face, saying that "it was contrary to his principles of business to lay out money not earned or subscribed." The other directors, county squires, were not inclined to disagree with the capitalist until the engineer put the question in the following shape— "If you borrow £30,000, at 5 per cent., it will cost you £1500 a year; you will earn £10,000 a year at least, to pay the £1500; but, if you won't borrow, you will save £1500 a year and lose £10,000 a year." Now, that is exactly the position of British India. Water will manure the land; and roads, and steamboats, and railroads will take produce to market, which will never be grown, and never pay rent or taxes, without irrigation works. Under the present system of centralized government and arrangement of the engineering department the least work in the largest time with the most money is the rule. Let us take for example of the want of useful knowledge in the governors of India, the new plan of forming a corps of civil engineers, to replace the amateurs from infantry and cavalry regiments, to whom roads and buildings were formerly not unfrequently intrusted. The idea is sound, but the benefit of it will depend on the execution.

The Secretary of State for India has recently issued an advertisement stating that "twenty junior Engineering appointments will be open to public competition in 1861." The conditions show a singular want of knowledge of the more essential department of the education of a civil engineer. "Candidates must not be more than twenty-three years of age," and "must have passed not less than three years as articled pupils of a civil or mechanical engineer." So far so good, but they have the alternative of substituting for two years of the apprenticeship two years of study "in a school or college recognized by the Secretary of State in council as possessing an efficient class for civil engineering; and, in addition, one year in practice under a civil or mechanical engineer." There is no point more completely settled in the minds of real civil engineers than that their profession can only be properly taught by actual work, and as there are plenty of young men to be found who have served an apprenticeship in the preparation and the execution of engineering works, there is no reason why India should not have the benefit of their services. There are schools of Civil Engineering and Mining in France and in Germany; but the best pupils fail, and have always failed, when put to new work. The pupils of the *Ecole Polytechnique* had to come to England to learn how to build a skew bridge, or any other bridge of peculiar difficulty; indeed it would be easy to give a long list of engineering works on the Continent, executed by English engineers, or copied servilely from the plans of English civil engineers, although described in conspicuous tablets as designed by French, Italian, and German engineers. Some very comic instances of this kind of plagiarism are to be found in Sardinia and in France.

As to Mining Colleges, we heard the other day a story of a learned professor of mining who was sent to Cuba with a well-known Cornish mining engineer to survey a copper mine in Cuba for the information of certain foreign and English capitalists. The Cornishman, whose scientific acquirements are not inconsiderable, although self-acquired, in the course of the voyage accurately gauged the depth of his accomplished companion's mining acquirement. He knew everything that had ever been written, or could be shown in a laboratory. The Cornishman determined to put the value of a school education in a practical art to the test. Accordingly, when they had descended into the mine, he sat down, lighted a cigar, and said,—"Professor, have the goodness, as you are entitled by virtue of your rank to the first place in this inquiry, to begin first; examine the mine, and give me your opinion on the value of the indications of ore." The professor, a perfectly honest man, to use an appropriate American phrase, "Caved in" at once, and acknowledged that he felt himself quite helpless and ignorant when out of the working of the *one* model mine to which he had been accustomed. In a word, to repeat a maxim which was laid down by one of the greatest of our engineers—"It is much easier for the man of practice to acquire the science needed in a practical art, than for the man of science to acquire the practice indispensable for commercial success." The same great engineer also laid it down that "every skilled mechanic was an engineer, but it was not every civil engineer who was a mechanic."

The subjects of examination for the Indian Engineering appointments include algebra, Euclid, statics, dynamics, hydrostatics, hydraulics, trigonometrical surveying, land surveying with compass and chain, levelling, use of the instruments employed. The total number of marks is 1000, and the least number that can win is 600, of which 140 must be for mechanics. Now, on looking over this list, it is quite evident that a man of twenty-three years of age, of industrious habits, and a taste for mathematical studies, might stand extremely high on the list without having ever done any real work, or seen any work out of a schoolroom, a drawing-office, and a field or two for the practice of surveying. There is not one subject set down that would bring out the experience of a young man who had been five or six years actively engaged in carrying out works, or working at, or superintending, the erection of machinery. Junior civil engineers are wanted in India, to carry out the instructions of their chiefs, to take charge of, or commence, works. The junior engineer begins with a salary of £200 a year, and a free passage to India; on arrival, free quarters are provided for him at a college, where instruction is to be given to him in one of the native languages, and "in the *profession*." When pronounced qualified by the president of the college, he is to be transferred to the effective establishment of the Public Works Department, with certain rights to pay, promotion, furlough, and retiring pension. The salary of probationary assistant engineers appears to begin at £20 a month, and to rise to £35, to £50, to £60, up to £120 a month. When it is considered that there are in the offices of practising engineers a great number of young men employed, at salaries of from £200 to £300 a year, with very little hope of promotion, perfectly competent to undertake engineering and mechanical works of every kind, it seems unwise to so frame the conditions of competition, that mere theoretical students should have a decided advantage over men of the same age, of perhaps equal natural talents, and much greater experience. It may be safely asserted that a young gentleman of twenty-three, who has never handled anything dirtier than a dictionary or dumpy-level, will be a dear bargain as compared with one who has been trusted to erect and work hydraulic machinery, construct railroads, docks, and other heavy works. The office of the Secretary of State for India is within a stone's throw of Great George Street, Westminster; might it not be

worth Sir Charles Wood's while to condescend to consult the leading men of the Institution of Civil Engineers on the best gauge for testing the qualifications of Indian assistant engineers? Under a judicious plan, the recruits would not have to spend several years and a share of the Indian revenue in making blunders and learning the elements of their business.

At the Annual General Meeting of the Institution of Civil Engineers on the 18th of December, amongst other matters, a short account was given of the state of engineering in the principal British Colonies. "A railway, the first undertaking of the kind in the colony, has been commenced at the Cape of Good Hope, to run a distance of 58 miles from Cape Town, through Stellenbosch, to the Paarl and Wellington." "The first section was expected to be opened shortly; and arrangements were making to connect the railway with the harbour works, now being carried out under an Act passed by the Colonial Legislature. The works comprise a pier, or breakwater, running from the western shore of Table Bay, in a north-easterly direction, for a length of 3250 feet, which would provide refuge "for shipping, and accommodation for unloading and loading. The cost is estimated at £400,000. In order to procure materials for the breakwater, which would be formed by a rough rubble mound, a basin was to be excavated, having an area of 10½ acres, with a depth of 20 feet at low water of spring tides, and there would be about 4100 feet of quays." "An outer basin, 4½ acres in extent, would, it was thought, be available for the trade in about two years and a half." We may add to this engineering information that the power of the Cape Colony to carry out these extensive works rests entirely on the progress of agriculture since the cessation of the last Kaffir war. Before that time, the rude implements of the Dutch colonists were almost exclusively in use; at present, there is a steady demand for the implements and machines of our best makers. Several thousands of Howard's iron ploughs have been imported by the Cape farmers, instead of the old four-wheeled Saxon plough; and, at recent agricultural meetings, threshing machines, drills, mowing machines, and reaping machines, were exhibited in competition. The Dutch-African sheep, too, without wool, and with an enormous fat tail, has been replaced by Merinoes. These pure Merinoes are likely to be crossed by some of our English breeds, in consequence of the demand which has recently arisen for meat. The Indian mutiny developed an export trade in Cape horses—the hardiest and most surefooted of any race with which we are acquainted. If the breakwater succeeds, the benefit to the Cape Colony will be incalculable.

In the three principal colonies of Australia, railway works are progressing on different plans, for, unfortunately, these three colonies are as much at variance in parliamentary opinions as England, Scotland, and Ireland before the Union. In New South Wales, the English 4 feet 8½ inches has been adopted, and the works constructed cheaply, for the use of the present generation, with wood where possible, instead of iron—a light rail and single track. The cost of single lines has averaged £10,000 a mile; a double line to Paramatta, the Richmond of Sydney, has cost £40,000 a mile. The Main Trunk Line, called the Southern, is intended to join the Victoria system at the river Murray, which is navigable by steamboats. The great difficulty of the railroad system of New South Wales is the range of the Blue Mountains, which hems in the Sydney district from the interior, where the principal wealth, agricultural and mineral, of the colony lies. One line is open about 33 miles, another about 8, and a third 28 miles. The Northern line, from the port of Newcastle, traverses and taps a country rich in coals and other minerals. In Victoria, the principal line open, 40 miles in length, is from the town and port of Geelong, in Port Philip Bay, to Melbourne, with extensive piers and wharves at Williamstown, which is the port of Melbourne. This has been constructed by a private company, but recently sold to the Colonial Government. Private companies have also constructed and retained a series of four suburban railroads to the villa villages round Melbourne. The Government has undertaken, and partly carried out an extensive system of railways on the most extravagant plan of construction. The gauge is 5 feet 3 inches; so a break of gauge, as well as a custom-house, will meet and tax goods on the New South Wales frontier. "The permanent way is of the most substantial character, consisting of a double-headed rail, weighing eighty pounds per yard, fished, and laid on chains, on native timber sleepers." "The larger rivers, creeks and ravines, have been generally crossed by viaducts, constructed with abutments and piers of bluestone, masonry, and wrought-iron superstructures." The cost of these two government railroads—one from Melbourne to the river Murray, 152 miles, and the other from Geelong to Ballarat, 52 miles, both to consist of a double way, was estimated at upwards of £34,000 a mile, or £7,000,000 sterling, of which three had been raised and expended. It is fortunate that the province of Victoria is so rich and flourishing, for every kind of extravagance seems to have been perpetrated on these government works. First, the electors by universal suffrage decided that the contracts should be given to colonists. Next, that the works should be used to keep up the price of labour by employing emigrants as they arrived. Then, the working day was shortened to eight hours, while the masons employed on the stone foundations of viaducts, &c., obtained 16s. a day, and maintained in idleness those masons who could not get as much from private employers. In fact, the colonists were taxed by the labouring classes in order to make railroads in the most expensive manner, and compete for the use of labour with public funds against private enterprise. What these solidly-constructed railroads are to carry in a country where the exports are gold and wool, and the heaviest items of imports, liquors and groceries, remains a mystery. In South Australia, a double line of 3½ miles from the city to the port, has cured the original drawback of the site. A single line from thence to Gawler, 29 miles, has been opened nearly two years, and this year extended 16 miles further to the mining district of Kassunda.

The Railways in operation in Canada at the present time amount to 2093 miles; the number of railways is fifteen, all but one constructed between 1852 and 1860. The average cost per mile of the main lines has been about £15,000, inclusive of rolling stock and other expenses; the cost of branches from £6000 to £10,000 per mile. The capital embarked in Canadian railways amounts to about £26,000,000 sterling, of which £4,161,000 is considered to be the contribution of the province of Canada.

There appears some hope of improvement in the most important department of the Admiralty, the constructive department. Sir Baldwin Walker—who is a gallant sailor and an accomplished man, but a mere amateur in the arts of shipbuilding, either in wood or iron—has resigned his post as head of the dockyards, and will, it is presumed, go back to what he really understands—commanding a fleet. In the present stage of naval construction, the country requires a man whom science and practice would enable to at least comprehend the value of the propositions continually brought before him—a man of the highest mechanical knowledge, accustomed to organize workmen. There is every reason why the nation should have the use of the services of the same class of men that great contractors consult and employ when millions are at stake. It is only noblemen who can afford to turn half-pay officers into stewards and bailiffs. It would be just as wise to make the Lord Chancellor's secretary clerk of the works, when building the new Palace of Justice, as to take a naval officer to superintend and direct the building of iron-cased or other ships of war.

The Isthmus of Suez question has been very quiet for a long time. A letter from Egypt, which is going the round of the press, mentions that some "twenty Arabs and two or three Europeans, are engaged in quarrying the stone that is to make the required miles of piers on the Mediterranean side. These piers alone would occupy the labour of some thousand quarrymen for two or three years: therefore, the Frenchmen and Arabs can only be considered the representatives of "The Man in Possession." It seems that neither the Egyptian nor the French shareholders can be persuaded to pay up on their calls. The money obtained from the Pasha has been spent on pamphlets and the Paris establishment. In fact, the whole affair, as a canal-cutting work, is a sham; but, if the company does not make a canal, it may do something not less remarkable, and even profitable. M. St. Marc Girardin, in a recent article on the Eastern question observes, after referring to the rise and conquests of our East India Company, "every organization on a European basis in the East, whether it be a railroad company or a canal company, a factory or an army, has a very good chance of becoming master of the whole country;" "and if the Isthmus of Suez Canal Company completes its undertaking, and in proportion as it becomes organized and established, the dynasty of Mehemet Ali declines;" "we may expect to see *the Suez Canal Company*

make itself master of Egypt in the same way that the East India Company became master of India—namely, by the *irresistible influence that organized bodies exercise over social atoms!*"

We have more than once alluded to the Metropolitan or Underground Railway. A map, showing the extensions for which parliamentary powers are to be sought next session, now lies before us, and they are of sufficient importance to deserve a detailed description. The original line, now in a forward state of execution, was planned to connect the Great Western and the King's Cross Stations with a central station in Farringdon Street. This was increased last session by a branch to the proposed meat market on the site of Old Smithfield Market, and also joined to the Blackfriars Bridge Street extension of the London, Chatham, and Dover Railway. The following branches or spurs are now projected—1, A subterranean line, starting from Regent Circus, at the corner of Piccadilly, and after falling into High Holborn, at the western end of Lincoln's Inn Fields, there nearly following in parallel line the track of that great thoroughfare, and joining the metropolitan station in Victoria Street, close to Farringdon Street; 2, A spur from the metropolitan station to a proposed central station in Finsbury Circus; 3, From Finsbury Circus Station one of two arms is extended to Shoreditch Station, and the other reaches to the London Docks and a wharf on the Thames east of the Tower; 4, A line constructed on the land of the Regent's Canal Company, connects the King's Cross station with Limehouse Basin, forming an inner circle and competing line to the North London Railway; 5, An extension from the Great Western Railway, with two forks, proposes to accommodate Shepherd's Bush, and Broadway, Hammersmith, omnibus traffic, and also form a junction with the West London, or Punch's Line; 6, Another is to accommodate Notting Hill traffic, near the turnpike, with one arm, while the other is audaciously pushed across Kensington Gardens by a tunnel west of the Round Pond, into High Street, Kensington, and up to the South Kensington Museum; it is said that this part of the plan is to be supported by an offer to construct a sunk road across the gardens for the use of carriages, and to fill up the holes in the Serpentine with the spoil of the excavations; 7, A line from King's Cross station tunnels under the Highgate range of hills, and, after throwing back a spur to join the Great Northern at Holloway, runs on through Hendon to Edgeware; 8, A station and line from Westminster Bridge to Blackfriars, connected with the plan for the embankment of the Thames. In this embankment and railway scheme Mr. Hemans, who was associated with Mr. Bazalgette before the Embankment Committee, has joined Mr. Fowler and Mr. Fulton. These projects do not altogether contemplate many miles of railway track, but, taken at a fair estimate of £250,000 a mile, they will require a round capital; and, if executed, will completely revolutionize the traffic of London. There are other schemes to be brought before Parliament, but the above are enough for the present "Notes."

Circular to Gas Companies.

There are twenty-four gas bills to be brought before Parliament during the ensuing session. Of that number, twelve are for the incorporation of joint-stock companies, five are for the transference of existing gas companies to local boards and municipal corporations, six are for obtaining further powers and for increasing their capitals, and one is for the incorporation of the Lime-Light Company.

The twelve bills for the incorporation of joint-stock companies comprise the Aldershot Gas Company, the Atherton Gas Company, the Clitheroe Gas Company, the Elland Company, the Haslingden Union Company, the Huddersfield Company, the Saltburn Improvement Company, the Sowerby Bridge Gas Company, the Sowerby Bridge Gas Consumers Company, the Whitworth Gas Company, the Wigan Gas-Meter and Fitting Company, and the Uxbridge Gas Consumers Company.

The object of all the incorporation bills is nearly the same. They seek legislative sanction to carry out the works, in most cases already established; and in so doing they propose to incorporate in their several Acts the Companies Clauses Consolidation Act of 1845, the Lands Clauses Consolidation Acts, and the Gas Clauses Act of 1847, with certain modifications. The first in alphabetical order, the Aldershot bill, varies from the other bills of this class inasmuch as the works at present established do not belong to a company, but are in the exclusive possession of Mr. Frederick Eggar, with whom contracts have been entered into by the company to be incorporated for the purchase of the works. The capital of the company is to be £15,000, divided into £20 shares, with power to borrow £4000. There are to be seven directors, of whom Mr. Frederick Eggar, Mr. W. Eggar, and Mr. J. A. Plow, are to be the three first. The maximum price of gas is fixed at 6s. 6d. per 1000 feet during the first ten years after the passing of the Act, and 6s. afterwards. Nothing is said about the illuminating power nor the purity of the gas.

In the Atherton, Bedford, Leigh, and Tyldesley District bill, the Water-Works Clauses Act is proposed to be incorporated with the other general Acts. The capital of the company is to be £60,000, divided into shares of £10 each, with power to borrow one-fourth part of the subscribed capital. The number of directors, in the first instance, is to be six, the company having power to increase the number to nine or to reduce it to three. They are authorized to purchase the works of the companies that now supply the district, and power is consequently to be given to raise the requisite amount, either by borrowing, or by the creation of new stock. There is no limitation of the price charged for gas, nor any standard of illuminating power. As this company supplies water as well as gas, many of the provisions of the bill relate to that matter.

The joint-stock company to be incorporated by the Clitheroe bill was established in 1836, with a capital of £3750, to which £2247 have been added out of profits; and the capital of the incorporated company is to consist of £6000 stock, and £19,000 in shares of £10 each, with power to borrow £8330. Nearly the whole of the stock capital thus created is to be vested in the present registered shareholders of the company as fully paid-up shares. The number of directors is not to exceed nine, of whom the members of the managing committee of the joint-stock company are to be the first. The maximum price is fixed at 6s. for twelve sperm-candle gas. The local board are authorized to appoint a person to test the illuminating power.

The preamble of the Elland bill recites at length the present financial position of the company, the capital of which amounts to £10,445, and it is proposed to raise it to £30,000, with power to borrow one-third. The sum of £3455, expended on the works out of profits, is to become a part of the paid-up capital, and the holder of each £10 share in the present company is to be entitled to a £15 share in the incorporated company. There are to be thirteen directors, in the first instance, who are to consist of the committee of management of the existing company; but the number may from time to time be reduced to ten. The meter-rents to be charged by the company are specified; the rent of a 3-light meter being fixed at 5s. per annum, that of a 5-light meter at 9s., and of a 60-light meter at 22s. The prices to be charged for gas are regulated by the cost of coal; the maximum, when the cost of coal at the works is 10s. per ton, is to be 5s. 10d.; and when coal costs more, the maximum price is to be raised to 6s. 8d. The illuminating power, "unless prevented by frost or unavoidable cause or accident," is to be only eight sperm candles; and the gas "shall, as far as possible, be free from sulphuretted hydrogen, or other compounds deteriorating its purity." The local board are to have the appointment of a competent person to test the quality of the gas. Power is to be given to the company to sell their works to the local board, or to any public or private company, and the local board are to be authorized to borrow money to make the purchase on the security of the gas-rents, the sum so borrowed not to exceed £20,000.

The Haslingden bill provides for the amalgamation of the Haslingden Gaslight and Coke Company, established in 1847, with the recently-formed Haslingden Union Gas Company; it being agreed between them that the former shall receive the value of their existing works, amounting to £8542, in shares of the incorporated company, the capital of which is to be £30,000, divided into £10 shares, with power to increase the capital by the issue of additional shares to the amount of £10,000, and to borrow also £10,000. The price of gas is limited to 6s. per 1000 feet for ten sperm candle gas. The appointment of an examiner is left to two justices, on application being made to them by not less than five gas consumers to appoint such a person.

The preamble of the Huddersfield bill states that the sums expended on the works of the existing company amount to £67,000, of which £28,000 were supplied from the profits of

the undertaking; that it is required to capitalize that sum by the creation of new shares, to acquire the freehold of the land on which the works are situated, to purchase other lands for the extension of the works, and to make provision for the transfer of the company's undertaking to the Huddersfield Improvement Commissioners. The clauses of the bill carry out the objects specified in the preamble. Among the other powers to be given to the company, they are to be authorized to manufacture and sell gas-fittings, pipes, meters, and all articles connected with gas-works. The capital of the incorporated company is to be £120,000, divided into shares of £20 each, power being given to borrow £35,000 more. The number of directors is not to exceed nine, nor to be less than three. The sum to be allowed anually as remuneration to the directors is not to exceed £250. The maximum price for twelve sperm-candle gas within the borough is to be 4s. 6d., and beyond its limits 5s. A separate clause gives power to the company to supply gas gratuitously for any purposes of public advantage. The company are to supply gas within twenty yards from their mains, but not at their own cost beyond fifteen feet. The Improvement Commissioners are to be authorized to appoint an examiner of gas; but no provision is made for the independent testing of the gas, in the event of the undertaking being purchased by the commissioners.

The Saltburn Improvement bill presents many anomalies. The capital of the Improvement Company is to be £12,000, divided into only 120 shares of £100 each, with power to borrow £4000. The number of directors is to be five, the qualification being the possession of not less than ten shares, and power is given to raise the qualification to twelve shares, and the number of directors to six; in which case they would hold more than half the property of the company. The directors are to be empowered to delegate their authorities to a managing director, with such salary as they may think fit. The Gas-Works Clauses Act is omitted from the incorporation of the general Acts, nor is there any limit to the price of gas, nor any standard of purity. By one clause of the bill, the Improvement Company are empowered to contract with any gas and water company for the supply of gas or water, and they "may empower any company with whom they may enter into any such contract, to open the streets, roads, and public highways therein, to lay down, maintain, replace ,and repair mains, pipes, and other apparatus for affording such supply of gas and water, in pursuance of such contract, subject to such restrictions as the company may think fit to impose."

The two bills for the incorporation of separate companies for the gas supply of Sowerby Bridge, in the parish of Halifax, though proceeding from competing companies, have one feature in common—viz., provision for the sale of their works to the local board. This is the more remarkable in the Sowerby Bridge Gas Consumers Company (Limited), as that is a new company, and only obtained a certificate of incorporation in November last. The capital of this company is to be £2000, divided into £5 shares, with power to borrow £3330. This consumers company bids for popularity by offering to supply 14-sperm-candle gas at a maximum price of 3s. 6d., and to keep the mains always fully charged. Though the sanction of three-fifths of the shareholders are required, by one clause of the bill, for the sale of their works to the local board, by another clause it is provided, that if the board should, at any time within five years from the passing of the Act, offer to purchase on such terms as will secure to each shareholder 6 per cent. interest on the amount of the paid-up shares, the sale will be obligatory. The existing company at Sowerby Bridge, formed in 1834, have expended on their works £16,479, and they now seek to raise their capital to £25,000. It is specially provided that a portion of the new shares to be created shall be allotted to the largest gas consumers of the company, who are not shareholders. The dividends on the new shares are to be limited to 8 per cent., and the retrospective payment to make up that amount is not to extend beyond three years. The number of directors is not to be greater than twelve nor less than seven, and they are empowered, as in the Saltburn bill, to appoint a managing director, and to allow him a salary. The maximum price for gas supplied within the district is to be 4s. 2d. per 1000 feet, and 5s. beyond it, with an illuminating power of ten sperm candles. Nothing is said in either of these two bills about the purity of the gas. In the clause giving power to sell the works to the local board, there is no compulsory provision, as in the former bill.

By the Uxbridge and Hillingdon Gas Consumers Bill, it is sought to raise the capital of the company from £11,000 to £16,000, and to obtain power to purchase the works of the Uxbridge Gas Company, and to lease their own undertaking; should the majority of the shareholders consent to the clause limiting the price of gas, one mile radius from the centre of the existing gas-works is taken, within which the maximum price for twelve sperm-candle gas is said to be 6s. The price beyond that distance is not named, nor is the purity specified.

The bill for the incorporation of the Whitworth Gas Company proposes to increase the capital of the company from £8250 to £36,000, with power to borrow £9000. The maximum price of eleven sperm-candle gas is to be 6s., the power of appointing an examiner being given to two justices.

The object of the Wigan Gas-Meter and Fitting Company's bill is to repeal the Wigan Gaslight Company's Act, and to transfer all its powers to the first named company, with which it is to be incorporated. The capital of the amalgamated company is to be £50,000, in shares of £5 each, and they are to have power to borrow one-fourth part of the paid-up capital. The illuminating power of the gas in this cannel coal district is fixed at only ten sperm candles, and the maximum price at 5s. 6d. per 1000 feet.

In the preceding bills for the incorporation of companies that have not legislative sanction, there are several in which provision is made for the sale of the undertakings to local boards of health and commissioners, though that object is generally made subservient to the professed object of incorporating the respective companies. In the five bills we have next to notice, the transfer of the existing gas companies to the management of local boards, or to municipal authorities, is the main object either expressed or readily understood. Several of these attempts to adopt the Manchester system of taxing the consumers of gas for the payment of local charges, which should be borne by the whole community, will, however, be vigorously opposed. The Bolton bill is openly promoted by the corporation, and it seems to take for granted that the existing gas-works will be transferred without any difficulty to the management of the municipal body. The Dover bill professes to be promoted solely by the Dover Consumers Gas Company, whose proceedings we have been called upon to notice on former occasions. Though apparently the bill of a recently formed joint stock company, applying to be incorporated, with a capital of £40,000, this unfledged concern has the assurance to ask for power to purchase the undertaking of the existing and long established Dover Gas Company; after which it is proposed to sell it to the local board, who are the secret promoters of the bill. Three other bills, the Tonge Improvement, the Middleton Improvement, and the Holmfirth Improvement bills, which propose among other objects the transfer of the management of existing gas companies to the improvement commissioners, so closely resemble each other that they might be supposed to emanate from the same source. The concoctors of these bills seem to be fully assured that the gas companies will be glad to accept any offer from the commissioners to purchase their respective undertakings.

The Macclesfield bill is of an opposite kind to the preceding ones. Its object is to rescue the Macclesfield Gas Company from the clutches of the local board, who obtained conditional power by the Macclesfield District Gas Act of last session to compel the existing company to sell their works. It was provided by that Act, that unless the company sold their undertaking to the board, or obtained a new Act within two years, in which the Gas-Works Clauses Act and other general provisions now introduced in all gas Acts were incorporated, the board should be empowered to erect works for the supply of gas. The company's bill embodies those clauses, and if passed, they would be free from the trammels of the board; but the latter, we understand, will struggle hard to prevent the company's escape from their grasp.

The Dewsbury and Batley Gas Bill, the Portsea Gas Bill, the Swansea Gas Bill, the Victoria Docks Gas Bill, and the Weston-super-Mare Gas Bill, seek merely for increase of capital and additional powers, and need not be further noticed on this occasion.

The last bill in the list is that of the Universal Lime-Light Company (Limited), to enable the company to make arrangements for supplying lime-light. The bill is laudably brief, the preamble and the interpretation clause occupying two-thirds of the whole. The principal object is to enable the company to grant licences to any corporation or "gas company" to

manufacture and sell "lime-light or lime gases." The amount of capital is not named.

We regret to perceive, from the proceedings of several vestries and district boards, that the working of the Metropolis Gas Act is not proceeding satisfactorily. The ill-feeling caused by the protracted agitation has not yet subsided, and the raising of the charge for lighting the public lamps, in retaliation for increased assessment, has tended to exasperate it. At a recent meeting of the Marylebone Council, this feeling broke out strongly on the announcement that the Chartered Company had raised the charge for lighting Oxford Street and and part of Marylebone one guinea per lamp—viz., from £3. 10s. per annum for a four-foot burner to £4. 11s. The contract was accepted for one year only, the object being, it is said, to call the attention of Parliament to the subject. The company may be legally entitled to make that charge, as the quantity of gas consumed would make the demand less per 1000 feet than the price charged to private consumers; but we question the policy of raising the price for public lighting to its maximum, except under peculiar circumstances. The events of the last three years ought not to be so soon forgotten. It was an advance in the charge for lighting the very same lamps that gave rise to the agitation, which has been the cause of so much animosity, attended with great loss of money in litigation. The stringent regulations of some of the clauses of the Metropolis Gas Act will place the companies in a difficult position, if they be rigidly enforced; and the threat of the district board of St. Olave's to the Surrey Consumers Company, of adopting means to secure a supply of gas free from impurity, should not be disregarded. It is to the interest of the companies to give the Act a liberal interpretation, and to avoid as far as possible from affording any pretext for complaint. The question on whose shoulders the expenses of obtaning the Act are to fall, has not been settled. The Metropolitan Board of Works have been informed by their legal adviser that neither the Local Management Act nor the Gas Act give power to the board to assess any portion of the expenses on the City of London. If that be the law, it will meet also the justice of the case, for it is only equitable that the parishes which promoted the bill should bear the cost.

Several of the daily papers have commented on the trial of the action brought against the Great Central Gas Company for having caused the fire in Wood Street, and have protested against the conduct of the insurance companies in endeavouring to throw the responsibility on others. To undertake a risk for a stated premium, and when damage arises to attempt to escape payment, is calculated to diminish public confidence in fire insurance in a manner that may be seriously detrimental to the interest of all such companies. We hear that it is intended to proceed with the other cases against the Great Central Company; but, after the full and fair trial already obtained, it is to be hoped such intention will be relinquished.

An extraordinary meeting of the shareholders of the Surrey Consumers Gas Company was held at the London Tavern, Bishopsgate Street, yesterday afternoon, "to receive and consider the report of the directors, relative to the management of the works on the expiration of the present contract with Mr. Croll." The meeting, which was a very stormy one, terminated at too late an hour to enable us to furnish a report of the proceedings in the present number of the JOURNAL. The result was the appointment of a shareholders committee, consisting of ten members, to confer with the directors upon the present juncture of the company's affairs, and to mature a plan for its future working, with full powers to treat with Mr. Croll, as to giving up the works, and to report the result of their investigations to the next half-yearly meeting.

Register of New Patents.

1452.—JOHN JAMES BOWEN, of 136, Great Dover Street, Southwark, London, and 308, Euston Road, London, for "*Improvements in soldering irons heated by gas.*" Provisional protection only obtained. Dated June 13, 1860.

This invention comprises the constructing of a moveable bit for a gas soldering-iron, by making such bit hollow with crosswise perforations. This hollow may be carried up or not to the solder at the point of the bit, as the practical purposes to which the bit is to be applied may require. The bit is to be screwed or secured into the proper stock. The gas is ignited into the stock of the bit, and should be forced on by means of a blow-pipe; the aerometer blow-pipe being the most suitable for the purpose. An instrument thus constructed will be found useful for soldering purposes generally. The above is a description of the nature of the said invention, the details whereof may probably be varied in practice.

1463.—RICHARD ARCHIBALD BROOMAN, of 166, Fleet Street, London, patent agent, for "*Improvements in desiccating substances, and in neutralizing or retaining any fœtid gases which may be evolved in the process.*" (A communication from MM. Légé and Danguy, of Paris.) Patent dated June 15, 1860.

This invention applies chiefly to the desiccation of fœcal matters, and to preventing the putrid exhalations therefrom escaping into the atmosphere. The invention is also applicable to the drying of sugar, chemical products, and other substances more or less solid.

The invention consists in forcing currents of hot air, or, in some seasons, dry air, through passages closed except to the admission of the air in the bottom of a closed vessel opening only into a shaft, in which vessel the matters to be desiccated are agitated, tossed about, and divided, by means of screws or shafts with arms caused to revolve rapidly. In the desiccation of substances giving off putrid or poisonous gases, the shaft is closed by the raising of a valve, which opens communication with a pipe leading into a passage containing some agent which will absorb, neutralize, or throw down the particular gases to be treated. The vessel contains a pump, which is caused to throw the agent from a rose spreader from the top of the vessel. After the neutralization, absorption, or deposit of the fœtid and poisonous gases, the air and non-injurious gases pass through the only outlet at the upper part of the vessel into a tube, and back into the first-named shaft above the point at which the valve is placed. When the gases are not required to be purified, the valve is lowered, when it closes the communication with the purifying vessel, and opens a free passage through the shaft. When the air is to be employed hot, a furnace is placed under the desiccating vessel with pipes, through which the air is driven by a fan with sufficient force to drive in the heated air through the valves in the bottom of the vessel. It is only in winter and wet weather that artificial heat is necessary; for, by prolonging the operation, currents of dry air are quite sufficient to effect a perfect desiccation. If, in order to purify the air, it were necessary to pass it through the liquid mass of the re-agent, there would be a pressure in the apparatus injurious to the operation, but the re-agent in the receiver being pumped up to the level of the upper tube, from whence it falls in rain or spray, it rapidly decomposes the gases and allows the air to escape.

The claim is for—

1. Forcing currents of hot or cold dry air into a closed vessel, having revolving screws or other appliances in it by which the materials are agitated, and having a tube at its upper part for carrying off fœtid or other poisonous gases to a receiver, to be there neutralized or retained substantially as described.
2. The arrangement of apparatus for desiccating materials as described.
3. The employment of a pump in combination with a rose spreader for throwing the neutralizing agent from the top of the vessel as described.
4. The construction of a furnace composed of pipes, through which air is driven, heated in its passage by the products of combustion playing around them as described.
5. The use of valves, screws, or fans in the apparatus, for desiccating substantially in the manner and for the purposes described.

1480.—THOMAS WILLIAM KEATES, of Chatham Place, Blackfriars, London, consulting chemist, for "*An improved mode of separating carbonic acid gas from the gaseous products derived from the distillation of peat and other vegetable matters.*" Patent dated July, 1860.

This invention relates to a mode of treating partially purified illuminating gas derived from the destructive distillation of peat, or other vegetable matter, so as to complete the purification of the gas by the absorption of the carbonic acid mixed therewith, and at the same time obtain a valuable product from the action of the carbonic acid gas thus absorbed. To this end, the mixed gases are operated upon as they come over from the retort, by first cooling them by passing them through some suitable form of condenser in the usual way. They are then conducted to a purifier containing oxide of iron, for the purpose of separating therefrom the sulphuretted hydrogen and the sulphides that may be contained therein. The mixed gases thus partially purified are next submitted to the process which forms the subject of the present invention, the object of which is not merely to complete the purification of the gas by removing the carbonic acid which, when present even in a very small per centage, materially affects, as is well known, the illuminating power of carburetted hydrogen gas, but also further to utilize the material which is employed in the destruction of the carbonic acid by the formation in the purifier of white lead.

The invention therefore consists as it were of a compound process or operation capable of yielding two distinct and important results.

To this end, a vessel or other apparatus of any suitable form or arrangement is provided, which will permit either of passing the gas through the liquid or of submitting the gas to a shower of the liquid, and this vessel is charged in the proper manner with acetate or other soluble salt of lead. Into the purifying vessel thus charged is conducted the partially purified gas, which, in passing through the liquid containing the acetate or other salt of lead, or in being subjected to a shower of the same, will part with the carbonic acid diffused throughout the volume of gas, the salt of lead taking it up, and forming therewith the chemical combination known as carbonate of lead or white lead. The heating or illuminating gas will thus be rendered free of carbonic acid, and the white lead as it accumulates in the purifier may be removed and washed and dried, after which it will be ready for the market.

The claim is for extracting from the gaseous products obtained by the distillation of peat or other vegetable matters, carbonic acid gas, and utilizing the same in the manner and for the purpose above described.

1521.—WALTER MACFARLANE, of Glasgow, N.B., engineer, for "*Improvements in water-closets, and sewerage and sanitary apparatus or appliances.*" Patent dated June 22, 1860.

This invention relates to the arrangement, construction and working of what may be termed dry water-closets, or receptacles for fœcal and other refuse matters of a generally similar nature. The apparatus consists of a cast-iron trough fitted with the discharge-valve at the end or side as may be most convenient, the bottom line of which is in a line with the bottom

of a trough, or slightly dipping or inclined, one surface of the valve being of a hard or inelastic substance, whilst the corresponding surface is of a soft or elastic substance. The valve is fitted with a hinge and lock; the actuating parts of the valve are placed on the outside of the closet or receiver, and also on the outside of the house or building; it may also be applied in the inside of the trough, if deemed preferable.

This invention also relates to the application of a lock, or levers, or cock, pins, screws, or other fasteners to such valves, for the purpose of keeping the discharge-valve water tight, the said fasteners being applied either in the inside or outside of the trough proper. A sliding valve is fitted inside or ouside of the trough to the same kind of discharge opening in the end of the trough, as already described—the bearing surface of the actuating or moveable part of the valve being elastic, whilst the corresponding surface is inelastic or *vice versâ*, the same being actuated by levers, screws, or other details.

The invention also relates to the system or mode of arranging and constructing water-closets, so that they may be emptied of their contents by the common dustman or attendant without his having access to the interior, the shape being such as that he can have complete control over the interior from the outside of the closet or building. It is preferred to discharge the contents of such receptacles into a common bucket with the aid of a small raker or other such implement, and thereafter empty the same into the soil-cart, thus entirely dispensing with sewers for such purposes.

The invention also relates to the application of the hereinbefore-described water-closets to dust-bins, whereby their contents are discharged into the dust-bin for the purpose of storing the combined results, and applying the same as manure on the ground in connexion with the house. No water supply is intended to be attached to these water-closets, but water or any deodorizing material may be applied, if preferred.

The invention also comprehends the application of the hereinbefore-described apparatus to soil or ordure-tanks, being fitted in connexion with the usual water-closet system of towns, for the purpose of separating the solid from the liquid matter, whereby the former may be emptied in the same way as water-closets, as hereinbefore described, whilst the liquid is discharged to the sewers in the following manner:—

The ordure-tank is of cast iron, of a size dependent upon the number of water-closets in connexion with it. In one of the sides, at the bottom, is a discharge apparatus similar to that already described, whilst the inlet-pipe to the tank dips down to near the bottom, and a perforated plate or division divides off a corner of the tank. The holes in this plate only allow the liquid to pass off through them to be discharged to the sewers, whilst the solid matter is emptied into a bucket, and thence to a soil-cart, as already described; a check-valve being placed in the inlet-pipe to prevent spasmodic discharges into the tank at the same time when it may be in process of being emptied. Cast-iron ash-bins, with lock-fast discharge apparatus at their end, side, or bottom, are so fitted that the dustman or attendant may be able to empty their contents without requiring to have access from the premises inside. On the inside is an angular or other opening for admitting the ashes and other matters, the leading feature being that no person can have access to the interior of the premises by this dust-bin.

Another part of the invention relates to the arrangement of gutters for the roofs of buildings. There is attached to the sides of the cast-iron centre or valley-roof gutters, a bracket or attachment for fixing or suspending the beams or astragals of the skylight in such a manner that the water of condensation on the inside of the sash may drop and flow into the gutter, and at the same time provide a passage for fresh air being admitted into the apartment. The said bracket may either be cast on to the gutter, or otherwise attached to it without bolts or screws.

The invention also comprehends the application to rain-water or other external pipes, of a pedestal at the bottom of each stalk of pipes. The general figure of the said pedestal itself, being of a base-like shape, and larger in its diameter than the pipe comprising the stalk, and made either square or angularly sided, having a socket in the upper end for receiving the spigot of the pipe. Attached to the outside of the socket, there is a bat for fastening to the wall, whilst at the lower part there is a spigot end, the outside diameter of which is equal to the diameter of the pipes above, for connecting it to the drains. A door may be also fitted in the front of the pedestal, for affording access to the interior of the pipes.

1530.—James Ward, of Queen Street, Pimlico, London, for "*Improvements in water-closets.*" Provisional protection only obtained. Dated June 23, 1860.

These improvements relate to the mode of supplying water to a closet by means of a regulator, which is accomplished in the following manner:—A plunger or piston works freely in a regulator or water-tight cylinder. Fitted to the plunger is a rod serving as a piston-rod, which passes through a stuffing-box in the top cover of the regulator or water-tight cylinder. The plunger or piston is raised by any suitable means in connexion with the piston-rod; it works by the handle of the closet, and is forced down by weights fixed on the piston-rod. The inlet and outlet-pipes for the water are fixed to the bottom of the water-tight cylinder. The inlet-pipe is opened and closed by a conical or other valve. When the piston is lifted by raising the closet-handle, the pressure is taken from the top of the valve, and it is opened by the pressure of the water beneath, which flows into the cylinder; and, on pushing down the closet-handle, the weights fixed to the piston-rod force down the plunger or piston, which presses upon the water contained in the cylinder, forcing it out at the outlet leading into the closet-pan, and, at the same time, closes the inlet by the pressure on the top of the valve being greater than that underneath. A valve may also be put in the plunger, to allow any water that may accumulate at the top through leakage to pass off.

PROVISIONAL PROTECTION
HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

2812.—Jean Cerille Marius Beziat, of 51, Rue de Malte, Paris, for "*Improvements in the means or apparatus employed for permitting, stopping, and regulating the passage of steam, water, and gases.*" Nov. 16, 1860.

2831.—Alexandre Louit Lévêque, of Paris, gentleman, for "*An improved apparatus for carburating or naphthalizing lightin g gas.*" Nov. 17, 1860.

2916.—John Robb, of Aberdeen, N.B., merchant, for "*Improvements in gas-stoves.*" Nov. 28, 1860.

3023.—Joseph Antoine Barde, of Paris, gentleman, for "*An improved portable apparatus for producing and purifying lighting gas.*" Dec. 10, 1860.

3064.—William Clarke, of 53, Chancery Lane, London, for "*Improvements in the manufacture of gas.*" A communication. Dec. 13, 1860.

3066.—Frederick John Evans, of the Gas-Works, Horseferry Road Westminster, and George Frederick Evans, of the Gas-Works, Brentford, engineer, for "*Improvements in the manufacture of illuminating gas.*" Dec. 13, 1860.

NOTICE HAS BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED INVENTIONS.

1878.—Francis Xavier Kukla, of Pentonville Road, London, for "*An improved self-regulating gas-burner.*" Aug. 3, 1860.

1956.—James Stuart, of Vulcan Place, Castor Street, Poplar, London, for "*Improvements in treating hydro-carbon oils.*" Aug. 13, 1860.

2018.—Robert West, of Walsall, in the co. of Stafford, gas engineer, for "*Improvements in the construction of wet gas-meters.*" Aug. 22, 1860.

2038.—Antoine Halter and Françoise Decorce, widow Douard, of 91, Rue la Malte, Paris, for "*Improvements in the manufacture of flexible tubes for the conveyance of water, illuminating gas or other fluids.*" Aug. 24, 1860.

2272.—Rees Reece, of Llandilo, in the co. of Carmarthen, chemist, for "*Improvements in treating lignite and certain bituminous mineral substances, so as to obtain products therefrom.*" Sept. 18, 1860.

2865.—David Auld, of Glasgow, N.B., engineer, for "*Improvements in regulating the pressure and flow of fluids.*" Nov. 22, 1860.

Parliamentary Intelligence.

ADDITIONAL NOTICES GIVEN FOR PRIVATE BILLS RELATING TO THE SUPPLY OF GAS AND WATER.

Aldershot Gas. (For lighting with gas the town and neighbourhood of Aldershot, and for other purposes.)

Dewsbury and Batley Gas. (To extend the limits of the Dewsbury and Batley Gas Company to part of the township of Thornhill; to authorize the said company to raise more money; to amend their Act, and for other purposes.)

Dewsbury, Batley, and Heckmondwike Water-Works. To amend the Dewsbury, Batley, and Heckmondwike Water-Works Act, 1856, and to authorize the construction of new works; and for other purposes.)

Dublin Corporation Water. (To enable the Lord Mayor, Aldermen, and Burgesses of Dublin to construct additional water-Works, and for other purposes.)

Hastings Western Water-Works. (For the better supplying with water of parts of Hastings and Saint Leonard's-on-Sea, and adjacent places, and for other purposes.)

Liverpool Improvement. (For enabling the mayor, aldermen, and burgesses of the borough of Liverpool to make new and widen existing streets within the borough, and for other purposes.)

Portsmouth Water-Works Company. (To enable the borough of Portsmouth Water-Works Company to raise further money, and for other purposes.)

Saltburn Improvement Company. (For incorporating the Saltburn Improvement Company, and for the improvement of Saltburn and adjoining places in the parishes of Marske and Skelton, in the north riding of the county of York, and for other purposes.)

Sowerby Bridge Gas Company. (For re-incorporating the Sowerby Bridge Gas Company; for enabling the company to raise further capital; for better supplying the town and neighbourhood of Sowerby Bridge with gas, and for other purposes.)

A BILL
TO ENABLE THE UNIVERSAL LIME-LIGHT COMPANY (LIMITED), AND GAS COMPANIES, AND OTHERS, TO MAKE ARRANGEMENTS FOR SUPPLYING LIME-LIGHT; AND FOR OTHER PURPOSES.

[*The words printed in italics are proposed to be inserted in committee.*]

Whereas, under the provisions of "The Joint-Stock Companies Act, 1856," the Universal Lime-Light Company (Limited) are incorporated for the making, manufacturing, and sale of oxygen and hydrogen gases, or their compounds, and of light produced from their ignition, and of lamps and other apparatus connected with such manufacturing, and the use of such gases for producing light upon the surface of lime or other materials; also for the purchase of patents or of licences under such patents for the production of light, particularly Bastable's patent of the fourteenth of September, one thousand eight hundred and fifty-eight; also for contracting to supply light, or erect works, for any of the purposes aforesaid, or collateral thereto; also for buying up or amalgamating with or entering into agreement or association with any other company having the same or similar objects, or which may tend to promote the objects aforesaid:

And whereas the light which the said company are specially established to produce might be used with advantage in private dwelling-houses and other buildings, and for street lighting, and could be conveniently and economically supplied through the agency of the companies, corporations, local boards of health, commissioners, trustees, and other bodies empowered to supply gas in various parts of the United Kingdom; and it is expedient that the said Lime-Light Company, and all or any such other companies, corporations, local boards of health, commissioners, trustees, and other bodies aforesaid, should be fully authorized to grant and accept licences, and enter into agreements for effectually supplying the said light to such persons within the respective districts of the licences, or parties to the agreements, as may be desirous of using such light; and that full powers should be conferred upon such licences or parties, to enable them within their respective districts to sell such light for such price and upon such terms as may be agreed upon between themselves and their customers:

And whereas the objects aforesaid cannot be effected without the authority of Parliament:

May it therefore please your Majesty,
That it may be enacted, and be it enacted, by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and of the Commons, in this present Parliament assembled, and by the authority of the same, as follows:

I. In construing this Act the several words and expressions hereinafter mentioned shall have the meanings hereby assigned them, unless there be something in the subject or context repugnant to such construction (that is to say):

The expression "the company" shall mean "The Universal Lime-Light Company (Limited);"

The expression "lime-light" shall mean any light which the company are incorporated to manufacture or sell;

The expression "lime-gases" shall mean the gases, or their compounds, or other substances, or materials used for producing lime-light;

The words "manufacture" and "manufacturing" shall mean and include all processes necessary for producing lime-light, and the words "supply" and "supplying" shall mean and include all things necessary for supplying lime-light or lime-gases to the consumer;

The word "corporation" shall mean and include municipal corporations, local boards of health, commissioners, trustees, or other body of persons, whether incorporated or not incorporated, who are or may hereafter be constituted or authorized by Act of Parliament to supply gas within any city, borough, town, or district in Great Britain or Ireland;

The words "gas company" shall be applicable to every or any company incorporated by Act of Parliament, with powers to supply gas within any city, borough, town, or district in Great Britain or Ireland;

The word "limits" shall mean the city, borough, town, or district within which the corporation or gas company may supply gas;

II. The company may grant licences to any corporation or gas company to manufacture and sell lime-light or lime-gases, or to sell lime-light or lime-gases manufactured or supplied by the company within the limits of the corporation or gas company, and to have the use, working, and benefit, or the exclusive use, working, and benefit within such limits, of all or any letters patent for the time being vested in the company, or in trustees for the company, and may transfer to any corporation or gas company any licence for the use of any letters patent which may have been granted or transferred to the company, for such consideration, and upon such terms and conditions, as may be agreed upon between the company and the corporation or gas company; but this enactment, or anything therein contained, shall not be held to authorize, or grant, or transfer to any corporation or gas company of any licence which the company could not lawfully have granted or transferred to individuals.

III. The company, and any corporation or gas company, may from time to time enter into agreements for the manufacture, supply, and sale of lime-light, or lime-gases, within the limits of the corporation or gas company.

IV. Every corporation or gas company, to whom any licence shall be granted or transferred by the company, or who shall have entered into any agreement with the company, under the provisions of this Act, may manufacture and sell, and supply, lime-light and lime-gases to any persons within their respective limits who shall desire to be supplied therewith, for such price, and upon such terms and conditions, as shall be agreed upon between the corporation or gas company and such persons respectively.

V. Nothing in this Act contained shall be held or construed to restrict any corporation or gas company from manufacturing, selling, or supplying, within their respective limits any description of light or gas which they can or may lawfully manufacture, sell, or supply, without a licence from, or agreement with the company, or to authorize any corporation or gas company without such licence or agreement to manufacture, sell, or supply any description of light or gas which, without such licence or agreement, they cannot lawfully manufacture, sell, or supply.

VI. The costs, charges, and expenses of applying for and obtaining this Act, and incidental thereto, shall be paid by the company.

VII. This Act may for any purpose be cited as "The Lime-Light Act, 1861."

Miscellaneous News.

DESCRIPTION OF A "GAS-PROVER," OR INSTRUMENT FOR ASCERTAINING THE QUALITY OF GAS.

By Professor ERDMANN, of Leipzig.

(From *Erdmann and Werther's Journal für Prakt. Chemie.*)

In making experiments upon the best modes of producing gas, which I have done in an extensive manner, I have come to the conclusion that the means usually adopted for ascertaining the illuminating power leave much still to be accomplished. With regard to photometric observations, it is well known how difficult it is to establish satisfactory results by that method, and that there are uncertainties attending it in more than one respect. One great obstacle experienced in such experiments, and to which sufficient attention has not hitherto been paid by gas engineers, is the influence which the kind of burner employed exercises upon the diffusion of light while the gas is burning. The true value cannot always be ascertained by comparing the light given by two different gases when consumed in the same burner. By employing a suitable burner, a gas which perhaps would otherwise give only a small light blue flame, can be made to produce a beautiful white light. In short, each gas requires its own peculiar description of burner, in the selection of which we must be guided by experience, and photometric observations can only be relied on in the comparison of different gases when such trials are made with suitable burners. Without attention to this point, such experiments not only involve difficulty, but are a waste of time.

Gas manufacturers require a simple, quick, and easy method for ascertaining the comparative value of different gases, and the average product from various materials, &c. For this purpose, an examination of the specific gravity of the gas is frequently resorted to; but this method, also, is not to be depended upon. If illuminating gas only contained carbon and hydrogen, the specific gravity, under certain conditions, would give the value of the different kinds of gas. But, independently of these, illuminating gas contains carbonic acid, carbonic oxide, and nitrogen, which have not the same specific gravity as olefiant gas or bicarburetted hydrogen. In cases where clay retorts and powerful exhausters are used in the process of manufacture, it is very difficult to ascertain the value of the gas by means of its specific gravity.

Under these circumstances, may I hope that the simple instrument for determining the illuminating power of gas, which is described in the following remarks, and which I have called the "gas-prover," will be found useful to the manufacturer of gas, as well as to the consumer?

The "gas-prover" does not directly measure the illuminating power, but it affords a criterion of its luminosity when consumed in a suitable burner; and I believe that the comparative value of gas cannot be so exactly nor so easily ascertained by any other method as by means of the "gas-prover." And, although the method which I propose may not be faultless or incapable of some improvements, I believe it is sufficiently accurate for practical purposes, and in photometric experiments will furnish a good guide to gas engineers in the choice of burners.

The principle of the "gas-prover" is founded upon the well-known fact, that by the admixture of atmospheric air, the flame of the gas is diminished; and at last, when that mixture has increased to a certain extent, the gas burns only with a small blue flame. The atmospheric air which thus becomes mixed with the gas, and diminishes the flame, is not sufficient to extinguish the light; but the oxygen combines with the carbon, forming carbonic acid, and at last, by a combination of from four to six volumes of air, the mixture becomes explosive. If one observes a Bunsen lamp, which is so constructed that the entrance of air can be gradually increased, it will be seen, by attention to the flame, which, for this purpose, is burnt under a glass cylinder, that the light becomes smaller by degrees, until at last it forms only a white point above the inner blue cone, and this at last also vanishes. The time of disappearance of this last trace of flame is pretty well marked. It might be supposed that gas would require more air to render it incombustible, as gas contains more carbon in the form of heavy hydrocarbons; and I have found, by experiment, that this, in a certain degree, and in ordinary circumstances, is really the case. But as the quantity of the heavy hydrocarbons determines the value of the gas, so the quantity of atmospheric air required to be mixed with it, to extinguish its flame, determines the measure of its value as a lighting material.

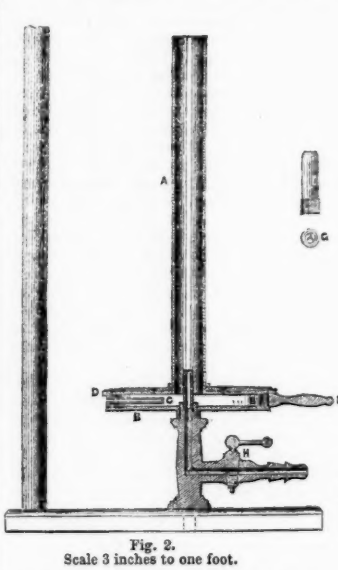


Fig. 2.
Scale 3 inches to one foot.

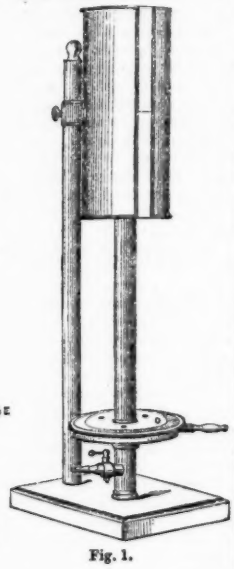


Fig. 1.

After this exposition of the principle, I now proceed to a description of the instrument itself. Fig. 1 is a perspective view, and fig. 2 an elevation of the "gas-prover," the form of which is that of the Bunsen lamp. *A* is a tube 7·7 inches long and 0·73 inch diameter, below which there is a hollow ring, *BB*, 3·78 inches diameter, for the purpose of allowing the air to enter. *C* is a slit which extends nearly half round the circumference. Over this cylinder or ring there is a moveable ring, *D*, by means of which the slit in the cylinder can be opened or closed at pleasure, to admit or exclude the air. Upon half of the upper surface of the cylinder, there is a graduated scale. The moveable ring is furnished with a pointer, which is placed upon zero, as shown in fig. 1. If the ring is turned round so that the pointer come towards the divisions, the slit opens, and you can read, by the degrees upon the scale, how much air is admitted to the flame. Above the burner is a cylinder, 3·15 inches diameter and 7·87 inches high, of blackened tin, fastened to a rod by a set screw, and in the front side of which there is placed a glass plate 1·18 inch broad, for the purpose of watching the flame. At the height of 3·94 inches in front of the glass plate is a line, and just opposite, on the inner wall of the cylinder, another line is inserted, in order to regulate the height of the flame. *F* and *G* represent the pipe through which the gas enters the burner from the side. The dimensions given above as to the width of the burners and of the cylinders, &c., have, as the result of many trials, proved themselves the best adapted to the purpose. A smaller tube does not allow the entrance of sufficient air for the combustion of the carbon in the gas; and a narrow cylinder creates too much draught, and, by the continued use of the apparatus, the cylinder becomes heated, and gets larger, whereby the flow of air is increased. The only object of the cylinder is to enable the flame to burn steadily. For this purpose, there is also a wire-gauze funnel, not too closely woven, and so arranged that the air can only enter through its meshes. If the gauze is too closely woven, the flame will be unsteady. The upper edge of the funnel reaches a little above the bottom of the cylinder, and is fastened to the burners pipe beneath by means of a moveable ring. The annexed diagram show-

the funnel and its fastenings. The meshes of the gauze are purposely made large, to make the drawing more clear.

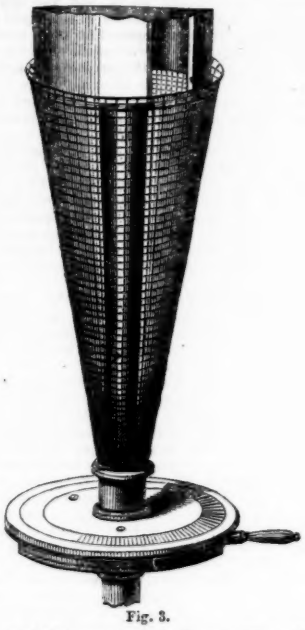


Fig. 3.

The operation of the instrument is as follows:—The pointer being placed at zero on the scale, the apparatus is to be used in the darkest possible spot; and, by means of an elastic tube, is connected to the gas-pipe, and the gas to be experimented upon is allowed to flow into it. The gas is then lighted and the flame regulated by means of a cock, so that its top exactly reaches the line, which is 3·94 inches high; and, to prevent errors of parallax, care must be taken to see that that line is exactly opposite the line on the inner side of the cylinder. If the air is calm, and the operator holds his breath, the regulation is effected without difficulty, the use of the funnel materially assisting in this object. The regulation of the flame being effected, the ring is turned by means of the handle very slowly from right to left, and by opening the slit, the air streaming in forces the flame up high in the first instance. As by this operation the eye is dazzled, further observations become difficult, and it is better to look at the side. By slowly turning the ring still further, making short pauses between each turn, it will be found that the flame loses its power until at length the light only shows itself over the inner blue cone. Upon this point attention is to be fixed, until, through the slits, this also disappears. The contour of the inner flame which was previously pointed now becomes round, and the flame appears much contracted. Upon turning the ring backward, the white light will again appear upon the top of the blue cone. The point at which, by the smallest movement, the white light is produced, will be easily found after practice. This point must be carefully observed, and the number of degrees required to open the slit sufficiently to destroy the flame, must be read by means of a small wax taper. By a little attention, the instrument may be easily employed, and constant practice will enable the operator to obtain better results. It is, however, true that in this respect practice is needed, and it is also necessary that the eye become accustomed to distinguish between inconsiderable differences of light; but, by observation and experiment, accurate conclusions may be obtained.

I will, however, give a few directions which are to be observed in making trials with the "gas prover." First, the ring must be turned very slowly, and, after each movement of about one degree, there should be a pause for a few seconds, to enable the mixture of gas and air in the pipe which has taken place, to ignite. The flame, which at the opening is large, and shows a white point, will only lose that after the gas, which is still in the burner, has been consumed and burnt. Second, after having, by slowly turning the ring, reached the point where the white light disappears, and the shape of the inner flame becomes pointed, it must be sought, by slow backward movement, to find the point where the first appearance of a light over the inner cone is visible. This must be as nearly as possible attained, without being actually accomplished. After the first reading, which I look upon as preliminary, I usually turn back the ring till the pointer stands at zero, and then proceed to regulate the height of the flame. This requires some time, because, on account of the smallness of the opening out of which the gas streams into the tube, several minutes must elapse before the flame attains its normal height. If the height is found to be correct, I turn the ring quickly so far that the pointer comes to the number of the first observation. Then, I allow a little time to pass, in order to ascertain that the flame shows no white point, and if this is not the case, I go very slowly back to convince myself that the first reading does not give too high a result.

The readings of the second observation appear to be more accurate than those of the first, and at all events the observations are repeated until they exactly accord. The experimenter is protected from self-deception in the fact that he cannot see the scale during the diminution of the light and the number at which the pointer stands, when the light is extinguished, is always the first to be read after the lighting of the taper. It is very essential that the air of the place in which the "gas-prover" is tried should be free from dust, as the particles of dust which get into the burner produce lighted sparks, and interfere with the perception of the point at which the lighted point over the blue cone disappears, thus making the result of the experiment uncertain. If there be soot with smoke in the air where the gas flame is burned, then the blue cone becomes covered with a yellowish red veil, which makes it impossible to determine the exact moment of cutting off the light.

The degrees on the scale of the "gas-prover" express no absolute value; their size is arbitarily determined, and they only give relative numbers. The illuminating power of gas is greater in proportion as it is necessary to open the slit wider for the admission of air to destroy the light. In a complete description of the "gas-prover," which will appear in the 3rd volume of the proceedings of the Physical Science Commission of the Royal Academy at Munich, I have described the result of experiments which show that the illuminating power of gas is very nearly proportioned to the quantity of air thus supplied. The gas used in the town of Leipzig, at the time of the experiments which I made with the gas-prover, required 34·38° opening of the slit. I mixed pure oil gas with coal gas, the quality of which was determined daily and calculated according to its value. Numberless trials proved that the mixing of 5 per cent. of oil gas raised the quality 5·5° of the scale; and the agreement of the ascertained numbers, and of those calculated after this manner, will be seen from the following table:—

							Ascertained Result.	Calculated.
95	per cent.	illuminating	gas of	35°,	with 5	per cent. of oil gas	38·5°	38·7°
90	,,	,,		35°	10	,, ,,	42·7°	42·5°
87·5	,,	,,		36°	12·5	,, ,,	45·2°	45·3°
85	,,	,,		35°	15	,, ,,	46·5°	46·2°
80	,,	,,		35°	20	,, ,,	50·3°	50·0°

In a second trial, the illuminating power of the gas was decreased by adding hydrogen, to see if the ascertained proportions would be the same with a less powerful gas.

						Ascertained Results.	Calculated.
90	per cent.	illuminating	gas of 38°,	with 10	per cent. hyd.	34·1°	34·2°
80	,,	,,	36°	20	,,	29·2°	28·8°
70	,,	,,	36°	30	,,	26·5°	25·2°
60	,,	,,	36°	40	,,	34·0°	21·6°

The last two mixtures are merely to be regarded as illuminating gas. One sees, from the above, that the ascertained result below 28° is less exact than with the more powerful gases. In experiments with gas from which, by a process of fumigating with hydrosulphuric acid, the illuminating ingredients were more or less completely withdrawn, similar results were shown. Gas, from which the heavy hydrocarbon was completely taken, shows, on testing, about 20·21°.

Eighty of these decarburetted gases, from 20°, with 20 per cent. oil gas, gave 39°; calculated, 38·8°.

Seventy of the same, with 30 per cent. oil gas, gave 48°; calculated, 47·7°, &c.

Mixtures of oil gas and hydrogen gave no great exactness, for instance:—

					Ascertained Result.	Calculated.
80	per cent. hydrogen	with 20	per cent.	oil gas	24°	22°
75	,, ,,	25	,,	,,	28·5°	27·5°
70	,, ,,	30	,,	,,	36·4°	33° &c.

It is generally found that these mixtures, in proportion, require too much oxygen for the burning of hydrogen; therefore, the proportionate numbers are disturbed.

(To be continued.)

ON THE LOSS OF LIGHT BY GLASS SHADES.

It will be in the recollection of our readers that in our issue of Feb. 24 last we inserted a communication from Mr. William King, relative to the loss of light by the intervention of various descriptions of glass shades. The November number of *Silliman's American Journal of Science and Arts* contains a notice of Mr. King's paper, written by Mr. Frank H. Storer, a distinguished American chemist, in which he remarks—"That Verver* had previously called attention to the subject in these words:—'It is not necessary to surround the wicks [of platinum, placed in the flame of the "water gas"] with glass chimneys, as is done with ordinary coal gas; on the contrary, it is preferable not to employ them, because the chimneys, no matter how well polished or how clean they may be, always absorb a considerable portion of the light which is produced. This loss (*déperdition*) was shown by the following experiment:—A burner with twelve jets, without any chimney, afforded an illuminating power of 6·75 candles; but on surrounding the wick with a clean and perfectly polished chimney, the illuminating power amounted to only 5·25 candles; it had consequently diminished 1·50 candles, *i.e.*, 22 per cent.' But, as Sebilling† has already remarked, this experiment alone does not prove that the whole of the lost 22 per cent. was absorbed by the glass of the chimney, since the conditions under which the gas is consumed when a chimney is used must be entirely different from those which obtain when no chimney is employed.

"Immediately after the arrival in this country of the journal containing Mr. King's note, I was requested by Mr. W. W. Greenough, agent of the Boston Gaslight Company, to institute a series of comparative experiments upon this subject. Since the results of these experiments have in the main fully corroborated those of Mr. King, it seems but just to this gentleman to give them publicity.

"Instead of lamp shades, flat sheets of glass (ordinary window panes), six inches wide by eight inches high, were fitted to a rack of blackened wire, which was fastened to the photometer bar (100 inches long) at a distance of three feet from the gaslight.‡

"The gas employed was prepared from the caking coal of Pictou, N.S., expressly for these experiments, and was contained in a special gasholder. The 'illuminating power' of this gas when consumed from the Parliamentary argand burner‖ at the rate of 5 cubic feet per hour—as in the following experiments—was equal to 16·00 candles consuming 120 grains, by calculation (in reality about 135 grains, as carefully determined by the balance in each case), of spermaceti per hour.

"The experiments were made in the blackened experimental chamber of the Boston Gaslight Company, with the photometer (Bunsen's) which I am accustomed to employ in my daily tests of the gas furnished by the company to consumers, every precaution being taken to insure accuracy. It may also be mentioned that none of the measurements (of the distances of the photometer from the standard candle), obtained by actual experiment, were calculated—*i.e.*, reduced to their equivalents in candles—until the whole series of experiments was completed, and that no comparison of my own results among themselves, or with those of Mr. King, was made until each member of the table had been calculated as it stands below. Whatever the

* *L'Eclairage au Gaz à L'Eau à Narbonne et L'Eclairage au Gaz Le Prince examinés et comparés par le* Dr. B. Verver, *Prof. de Chimie et de Physique à l'Athénée Royale de Maestricht.* Leide, 1858, p. 26.

† In his *Journal für Gasbeleuchtung, etc.*, München, 1859, ii., 377.

‡ It does not appear that the distance from the source of light at which the glass screen is placed has any appreciable influence upon the amount of light transmitted by it. At all events, no such influence could be detected in a number of experiments made purposely to test this question.

‖ With the ordinary chimney.—Mr. King does not specify what burner was used in his experiments, but it was probably the "fish-tail," which has been so often recommended as a standard, by his father, consuming 4 feet per hour, of course without a chimney.

experiments may be worth, therefore, they have at least the merit of being entirely independent and wholly unbiassed.

Description of Glass.	Thickness of Glass.	Loss of Light. Per Cent.
Thick English plate	1/3 of an inch	6·15
Crystal plate	1/8 „	8·61
English crown	1/8 „	13·08
"Double English" window glass	1/8 „	9·39
"Double German"§ „	1/8 „	13·00
"Single German"§ „	1/16 „	4·27
Double German,§ ground¶	1/8 „	62·34
Single German,§ ground¶	1/16 „	65·75
Berkshire (Mass.), ground¶	1/16 „	62·74
Berkshire enamelled, *i.e.*, ground only upon portions of its surface—small figure	1/16 „	51·23
"Orange-coloured" window glass	1/16	34·48
"Purple" „ „	1/8 As used for church windows, &c.	85·11
"Ruby" „ „	1/16	89·62
"Green" „ „	1/16	81·97
A porcelain transparency (Tyrolese Hunter)	1/16 „	97·68

"The term 'loss of light' employed by Mr. King does not at first sight seem to be strictly appropriate, for a very considerable portion of the light not transmitted by a glass shade might be reflected against the walls of the apartment in which the lamp is burning, and thus aid in the general illumination of the room. The meaning which Mr. King attaches to the term is however so perfectly evident that I have not hesitated to follow him in using it. For that matter, there can be no doubt but that the numbers given by us, express as accurately as the circumstances of the case will admit, the actual diminution of the amount of light, falling for example upon the pages of a book held near to its source, which would be occasioned by the interposition of the shades enumerated in our tables."

Boston, April 20, 1860."

The editors append the following note to this comunication :—

"We cannot doubt that the great loss of light proved by the experiments above given is to be, in part at least, accounted for, by the conversion of a portion of the light into heat—an effect perfectly in harmony with the theory of transverse vibrations as applied to explain the phenomena of polarization of heat. On this theory, heat and light are different effects produced by one and the same cause, and they differ physically only in the rapidity and amplitude of their vibrations. The screen through which the vibrations of light are propagated, serves to diminish, first the rapidity of the vibrations requisite to produce the most refrangible rays, and in proportion as the transparency of the screen is diminished by any cause, inherent or superficial, this arrest becomes more and more complete. As the more rapid etherial vibrations have probably the least amplitude, we infer from analogy in sound-waves, that as waves of least intensity have the greatest amplitude, so with the luminiferous ether the extreme red has but little brilliancy. Hence the loss of light from polished screens is small compared with that observed in screens of opaline or roughened glass. It would be instructive to examine the spectrum obtained from a pencil of rays under each of the cases given, by means of a sulphid of carbon prism.

"The subject of absorption of light by screens has long since been carefully examined by *Bouguer*.* By a photometric method essentially like Rumford's, Bouguer measured the loss of light in the beam of a candle compared with a flambeaux, and also with the light of full moon, in passing through 16 thicknesses of common window glass having an united thickness of 21·43 millimetres = ·85 inch. The mean loss of light shown by these trials was as 247 : 1, or over 99 per cent. of the whole quantity.

"Six plates of the purest mirror-plate glass having an united thickness of 15·128 millimetres diminished the light in the ratio of 10 to 3, occasioned a loss of about 70 per cent. of diffuse daylight. A mass of very pure glass, about 3 inches thick, diminished the light only about half the latter amount, owing to its being a single mass and not cut up into many planes.

"He also measured the absorbing power of sea-water for light and found as the results of experiments made in France and of observations also in the torrid zone that, at the depth of 311 French feet, the light of the sun would be equal only to that of the full moon, and at the depth of 679 feet would wholly disappear. He estimates the transparency of the air as 4575 times greater than that of sea-water, and from the properties of a logarithmic curve (which he calls *graduleucique*) whose functions he had determined experimentally, he seeks to fix the outer limits of the atmosphere. Bouguer was an expert geometer, and sustains all his conclusions by mathematical demonstrations. His results seem to have received less attention than they merit, the only reference to his researches I have seen being by Daguin in his exellent *Traité de Physique*, iii., 300, 1859.

"We should not omit in this connexion to refer to the very interesting observations of Draper† on the spectrum formed by means of a platinum wire heated gradually from dull redness to perfect whiteness by a volta-electric current. He observed the red part of the spectrum to appear first; and, as the heat and brilliancy of the wire increased, the other colours of the spectrum appeared after the violet. This result perfectly harmonizes with views above expressed."

EXPERIMENTS UPON TURBINE WATER-WHEELS AT THE PHILADELPHIA WATER-WORKS.

[From the *United States Railroad and Mining Register*.]

Extract from the Report of the Chief Engineer of the Water-Works, to the Select Council of the City of Philadelphia.

Gentlemen,—In answer to your resolution of May 31, 1860, the department would submit the following general report upon the experiments made with turbine wheels at Fairmount Works :—

An experimental apparatus was constructed at Fairmount Works for the purpose of testing such turbine water-wheels as might be presented. The department entered reluctantly into these experiments. First, for want of time to conduct the investigation with the care and detail which their importance demands. Second, on account of the limited appropriation made to carry them out. Third, the delay consequent upon the experiments in completing the plans and details of the works, and also the difficulty felt in making deductions from model experiments which would guide us in the selection of wheels of the great power required for these works. So far, however, as these experiments have been prosecuted, they have been carefully done. The tests were made simply for the purpose of ascertaining what proportion of the power employed would be utilized by the different wheels or their co-efficient of useful effect. The wheels were tested under a head and fall of six feet, and weights of from 500 to 1600 pounds were raised from 14 to 25 feet.

Nineteen different wheels were tested, and 122 experiments made with them. Several of the wheels were removed without submitting them to a public test; of these no accounts have been kept. The accompanying table, marked "D," exhibits the best results obtained from some of the wheels. Mathematical accuracy was not aimed at, but the experiments may be relied upon as practically correct. The apparatus was of the most simple character, and the arrangements such that no mathematical formula was required to ascertain the amount of water used or result produced, but they were actually weighed and measured.

It was necessary to refuse to test a number of the wheels, as the appropriation was all exhausted, and the completion of the plans for the wheels could be no longer delayed, and the department was so fully occupied with the extension of the works, that time could not be found to pay them the proper attention.

Valuable assistance was rendered in these experiments by the chairman of the water committee, O. H. P. Parker, Esq.; James Millholland, of Reading; Wm. B. Bement, and Charles S. Close, of this city. Among the wheels which produced the best results, and to the makers of which certificates have been given, as shown in the accompanying paper marked "D." the highest co-efficients of useful results were produced by the Jonval wheels, made by J. E. Stevenson, of Paterson, New Jersey, and E. Geylin, of this city; and a modification of the Parker wheel, made and patented by Andrews and Kallbach, of Burnville, in this State. The majority of the wheels worked very satisfactory, and the makers of them were mechanics of more than ordinary ability. It is believed that no country could produce from the same number of wheels, promiscuously collected, as satisfactory series of experiments.

The best result was procured from the Jonval wheel, made by J. E. Stevenson, of Paterson, New Jersey, which gave an actual useful effect of the power employed of nearly 91 per cent. The wheel of Andrews and Kallbach, of Pennsylvania, is remarkable for its simplicity, and had it been constructed with the same amount of care and finish as that of some of the others, it is believed that the co-efficient of useful effect would not have been surpassed by any. Two of these wheels placed upon a horizontal shaft might make a most desirable arrangement for our new works, but the department is not prepared to recommend their adoption, as it might involve a risk of a failure, and we are averse to making any experiment at so great an expense and loss of time which might result to the city. We have been unable to find any wheels now in operation, of the aggregate power that we will require, or arranged in the above manner, or under similar circumstances to our requirements.

The department, therefore, see no reason to change the plans of the works, and will adopt the Jonval turbine, arranged and geared similar to the one now in use at Fairmount.

In coming to the above decision, and recommending the Jonval wheel, the department has been influenced by the following considerations :—

First. They have always been esteemed among the most efficient wheels; and, although other forms of wheels have been removed to give place to Jonval turbines, the department does not know an instance where the turbine wheel has been taken out to introduce another form of wheel. Our experiments upon the turbines have also proved them the most effective, giving the highest co-efficient of useful effect. See table appended marked "D."

Second. They are the best adapted to our particular situation, on account of the comparatively small fall at Fairmount, and the large amount of power required for each wheel (a mean of 125 horse-power), and the low velocity they run as compared with other turbines, making less reduction of the speed necessary by means of gearing.

Third. Their durability, and the facility with which repairs and renewals can be made.

Fourth. They can be constructed and connected to the pumps at as small cost as any other form of turbine wheel. No objection can be urged against the Jonval wheel, arranged as proposed, except that involving mere mechanical arrangements, viz.:—the step and bevel gearing necessary. Practically, these are not objections; the step of the present wheel at Fairmount works has required but one renewal since it has been erected, which is the only repair found necessary to the wheel; and as regards the bevel gearing, or reducing the velocity for the proper speed of the pumps by two to four wheels, there is only an apparent additional use by friction, but none in reality, as a little reflection will demonstrate.

Fifth. The favourable experience the city has had with the wheel of this kind at Fairmount, built by Emile Geylin, which has been in constant use since December, 1851.

The reasons for rejecting the plan of two wheels upon a horizontal shaft as recommended by the former chairman of the committee on water, are as follows :—

First. Our minimum head and fall is but eight feet. To produce 125 horse-power by two wheels would require each of them to be 50 inches in diameter, and they would occupy so large a proportion of the head and fall that the co-efficient of useful results would of necessity be low.

Second. The experiments made by the department at Fairmount proved that two wheels arranged upon a horizontal shaft will not give as good a result as one on a vertical shaft. Two Parker wheels arranged upon this plan gave but a co-efficient of 67 per cent. while a Parker wheel by the same maker on a vertical shaft gave a co-efficient of 75 per cent. Two Jonval wheels upon a horizontal shaft gave but a co-efficient of 68 per cent., when one Jonval wheel by the same maker, on a vertical shaft, produced a co-efficient of 82 per cent.

Third. The velocity of the wheels would be so great, (from 70 to 96 revolutions per minute with the two wheels, while the one Jonval wheel upon a vertical shaft will make but from 31 to 42 revolutions per minute,) and the reduction of the speed by means of gearing to the speed of the pumps would therefore involve much greater loss by friction than could in possibility be the result of the plan adopted for the gearing of the Jonval wheel as proposed.

In obedience to a resolution of the committee on water, the department addressed letters to J. E. Stevenson, of Paterson, N. J.; E. Geylin, of Philadelphia; Andrews and Kallbach, of Burnvill, Pa.; and Levi Smith, of Reading, Pa. In answer to these, the following propositions were received and opened by the committee on water, April 24th :—

§ Among the Boston dealers, the term German is applied to glass of Belgian manufacture.

¶ The enormous resistance to the passage of light which is offered by ground glass is certainly worthy the attention of those using it for windows, &c.

The discrepancy between Mr. King's results and my own as regards ground glass may perhaps be owing to the fact, that the window glass used by myself was *more coarsely ground* than the lamp shades employed by him.

* *Traité d'Optique sur la Gradation de la Lumière (Ouvrage posthume) : publié* par M. l'Abbé de la Caille. *Paris*, 1760, 4to., pp. 368.

† Silliman's Journal [2], iv., 388, and v. 1.

From Emile Geylin, of Philadelphia, for three Turbine wheels	$6,900
Gearing for the same	16,500
Total	$23,400
From J. E. Stevenson, of Paterson, N. J., for three Turbine wheels.	$15,000
Gearing for the same	14,500
Total	$29,500
From L. Smith, Reading, Pa., for each Turbine wheel	$4,130
Gearing for each wheel	4,360
	$8,490
Total	$25,470

And at a subsequent meeting of the committee, May 22nd, a proposition was received from Hunsworth, Eakin, and Co., of this city for three Turbine wheels and gearing $26,566 80

Care has been taken by the department not to commit the city either in the advertisement or in letters addressed to makers of wheels, in such a manner as to give the maker of any wheel, which might be presented for test, a claim upon the city. This was done that the department might not be embarrassed in considering simply the interest of the city in selecting and constructing the wheels. In regard to the form of wheel recommended, none of the Jonvals tested claimed any patent or peculiarity of construction, but simply differed in proportion and mechanical finish.

At the recommendation of the committee on water, the department has made arrangements with Emile Geylin, of this city, to construct two Jonval Turbines for the works.

Respectfully yours, HENRY P. M. BIRKINBINE, Chief Eng.

TABLE "D."

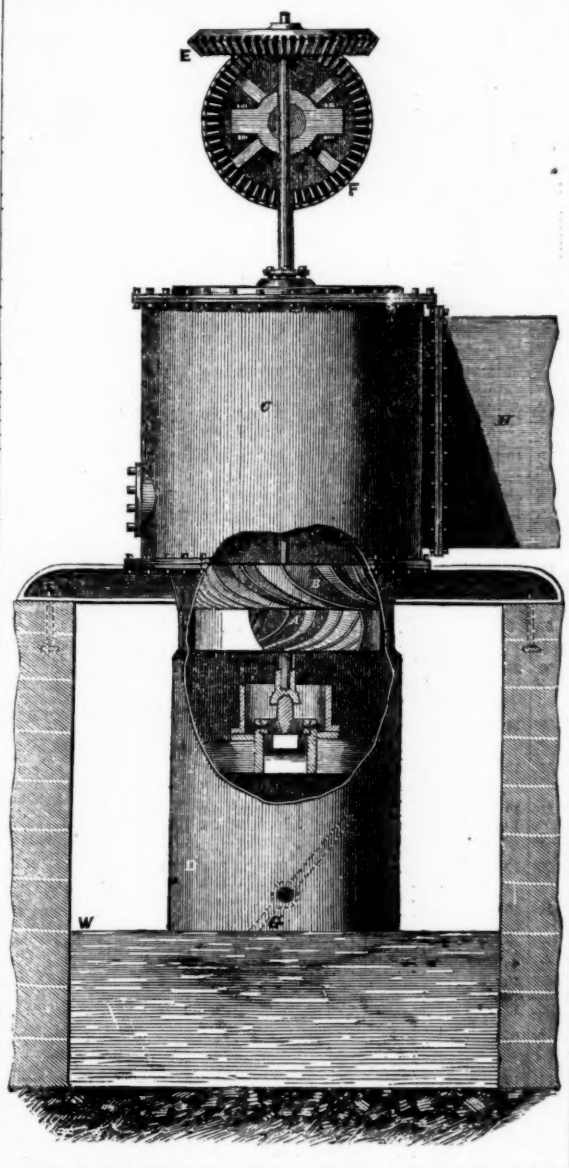
Referred to in the Report, exhibiting the results obtained.

Names of Parties to whom Certificates were given.	Weight raised in Pounds.	Height raised in Feet.	Cubic Feet of Water discharged.	Head, in Feet.	Time in Seconds.	Ratio.	Date of Trial.
							1859.
Monroe and Bartlett	850	25	105·72958	6	39	·5359	Oct. 7
Reuben Rich	750	25	80·19836	6·1	33	·6132	,, 20
J. Littlepage	1600	14	109·384	6·05	25	·5415	Nov. 22
J. Tyler	825	25	77·21516	6	25·5	·7123	Dec. 19
							1860
N. R. Merchant	1100	25	114·356	6	32	·6412	Jan. 12
L. W. Blake	925	25	86·0156	6	28·3	·7169	,, 20
Collins, Haydock, and Wildman	900	25	78·309	6	27·6	·7662	Feb. 9
L. Smith	1300	22	100·75758	6	20·3	·7569	,, 21
E. Geylin	1000	25	81·19276	6	26	·8210	,, 29
J. E. Stevenson	925	25	70·25436	6	23·6	·8777	Mar. 9
A. P. Mason	750	25	79·0548	6	27·6	·6324	,, 16
Andrews and Kallbach	700	25	56·9294	6	18·6	·8197	,, 28

The *Scientific American* contains the following description of the turbine which produced the best results:—

"Before giving a description of the accompanying engraving, it will be well to state the object of the late trial of turbine wheels at the Fairmount Water-Works, and also describe the apparatus and the manner of testing, &c. The principal objects aimed at in the trials were, to ascertain the wheel best adapted to the location and the work of pumping, and also the one that would give the greatest ratio or per centage when working at its maximum power. The head and fall at Fairmount vary with the tide from 8 to 12 feet; and the new wheels were each to be of the power to drive two double-acting pumps of 6-feet stroke and 18 inches bore, at a velocity from 10 to 16 revolutions per minute, raising the water 120 feet to the reservoir. The power of the wheels would be on an average that of 125 horses; and, as their velocity would be much greater than that required for the pumps, the speed would have to be reduced by a combination of gearing. The head chosen for the trial of the model wheels was 6 feet, and the same combination of gearing was used to reduce the speed to the barrel-shaft as would be required for the large wheels. The model wheels were to discharge 200 cubic feet of water per minute under the 6-foot head, but the size of the wheel was left to the judgment of the maker. The mannner of testing was the raising of a weight to a certain height, and measuring the water used by the wheel in the given time; and in order to do this an apparatus was constructed, which consisted of a receiving-tank and penstock, to which was attached a box, answering the purpose of a wheel-pit, in which the wheels were placed and secured to the penstock. Below the wheel-pit was the measuring-tank, into which the water was discharged from the wheel while the weight was being raised. This tank was just 5 feet square, and perfectly level. To the outside, and communicating with the inside, there was attached a glass tube and a graduated scale, to mark the exact height of water in the tank. Leading from the weir or overflow of the wheel-pit, and directly over this tank, was an open spout or conduit, arranged with a gate in such a manner that, at a given signal, the water discharging from the wheel could be instantly turned into the tank, and as quickly checked. Above and over the wheel-pit a shears was erected, and on the top was placed a sheave about 2½ feet diameter, over which a rope passed from the drum to the box containing the weight below, giving a height of about 50 feet for the weight to rise.

"The wheel being set in its place, and the rope attached to the barrel-shaft being extended over the sheave to the weight below, the wheel was started and the weight raised a short distance and there held to straighten it. A distance of 25 feet was measured off by a line, and two signal marks tied to the rope; a stationary signal point was also fixed for these to pass, and all was so arranged that by the wheel running a certain time, and the weight steadily rising, the water was instantly turned into the registering-tank below, at the first signal, and at the second it was quickly turned from it, and the height of water in the tank was then noted down. In order to avoid error in the working of the apparatus, each weight was raised successively three times, and the average amount of water was taken as one experiment. In the case of the wheel here described, there were 13 experiments with weights from 750 to 1100 pounds, varying 25 pounds each. The time varied from 20 to 36 seconds, and the greatest result produced was ·8777 per cent., or 925 pounds raised 25 feet by 70·25 cubic feet of water, under a head and fall of 6 feet [(925 × 25) ÷ (70·25 × 62·5 × 6) = ·8777]; to this must be added the friction of the transmitting machinery, estimated at 3 per cent., making a total useful effect of ·9077 per cent. of the power employed. The average per centage of the thirteen experiments was ·8483 + ·03 = ·8783. The transmitting machinery consisted of one pair of bevels of 17 and 69 teeth, a counter-shaft, and one pair of spur wheels of 60 and 96 teeth, and barrel-shaft; also the pulley-shaft on top of shears, reducing the speed from 20 to 24 revolutions of drum-shaft per minute.



"The accompanying engraving is a representation of the turbine. H is the trunk for conveying the water into the case or penstock. D is the draft-box or suction-tube, which, together with the case, is partly broken away to show the moveable wheel or turbine A, the stationary or guide-wheel B, and the bridge or step arrangement. G is a gate inside the draft-box, and it is operated by a lever. E F are bevel gears. The draft-box is an air-tight tube inclosing the wheel and extending down into the tail-water, W, to a depth sufficient to prevent the air from entering and destroying the partial vacuum or draft upon the wheel. A wheel of this kind, located between the two levels of the fall, gets its power from below as well as above; by opening the gate, G, the whole column is set in motion; the water entering the case above through the trunk, H, on one side, takes a circular motion around over the stationary or guide-wheel, B, in the direction of the wheel's motion, thus giving the momentum of water entering the case to the wheel, and at the same time equalizing the pressure on all the buckets. This is a new feature of the Jonval turbine, and is considered a good one for maximum power wheels, and especially where the water has to be conveyed a long distance to the wheel, as a much smaller trunk or pipe can be used, and considerable expense saved. But the same results will be produced where the water can be brought in over the wheel in a large body at a reduced velocity by a proper construction of the guides. The great per centage of power obtained by this over the other Jonval wheels, at the late trial, was produced by the difference in form and curve of bucket and guide, and the proportions of the wheel generally. It was a strong, practical working wheel, 22 inches in diameter, with well finished brass buckets, a step of *lignum-vitæ*, 2 inches in diameter (the usual size for such wheels), and the journals of the shafts were 1½ inches in diameter by 5 inches long. This wheel can be built in different forms to come within the means of all manufacturers, and it affords at the same time a first-class power. "J. E. STEVENSON, Millwright.

"*Novelty Iron-Works, New York, Aug.* 25, 1860."

Share List of Gas Companies.

(Directors and Managers of Gas-Works are earnestly requested to enable us to rectify the errors and fill up any omissions in the following List.)

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£	**ENGLAND.**	£ s d	£ s d	£ s d
		Aberavon			
		Aberdare			
		Abergele			
		Aberystwith			
530	10	Abingdon	10 0 0	6 0 0 & Bns. of £3.	12 0 0
1050	10	*Accrington Gas & Water*	10 0 0		15 0 0
1050	10	Do., new shares	10 0 0		15 0 0
2100	5	Do., do.	5 0 0		7 10 0
2100	5	Do., do.	1 0 0		1 10 0
2100	2½	Do., do.	0 10 0		0 15 0
1000	5	Airdale (Limited)	5 0 0	8 0 0	7 10 0
200	5	Do., new shares	1 15 0	8 0 0	
24	75	Alcester	75 0 0	4 0 0	80 0 0
128	10	Aldborough (Limited)	10 0 0	5 0 0	
1500	10	Aldershot (Limited)			
300	6	Alfreton	6 0 0	5 0 0	5 10 0
		Alnwick			
		Alston Moor			
250	10	Alton	10 0 0	10 0 0	12 0 0
1600	5	Altrincham	5 0 0	6 0 0	6 0 0
		Amersham			
170	10	Ampthill	10 0 0	4 0 0	9 0 0
350	10	Andover	10 0 0	6 0 0	
358	5	Appleby	5 0 0	2 10 0	2 15 0
230	10½	Arundel	10 10 0	10 0 0	10 10 0
250	10	Ashbourne, Derby	10 0 0	6 0 0	13 10 0
292	5	Ashburton	5 0 0	5 0 0	
84	30	Ashby-de-la-Zouch	30 0 0	6 0 0	
700	10	Ashford (Limited), Kent	10 0 0	6 0 0	11 10 0
1600	30	*Ashton-under-Lyne*	30 0 0	10 0 0	60 0 0
590	5	Atherstone	5 0 0	9 0 0	8 10 0
		Attleborough			
		Axminster			
200	20	Aylesbury	20 0 0	5 0 0	21 0 0
150	10	Aylsham (Limited), Norfolk	10 0 0	5 0 0 & Bns.	12 10 0
3093	10	*Bacup (Rossendale Union)* ordinary	10 0 0	9 0 0	19 0 0
600	10	Do., preference	10 0 0	9 0 0	19 0 0
2597	10	Do., new issue	1 0 0		2 10 0
		Bakewell			
200	10	Baldock	10 0 0	5 0 0	10 0 0
1000	10	Banbury (Limited)	10 0 0	7 10 0	15 0 0
2150	10	*Bangor Gas & Water*	10 0 0	5 0 0	10 0 0
260	10	Barnard Castle	10 0 0	5 10 0	10 15 0
800	5	Barnet	5 0 0	6 0 0	5 10 0
		Barnsley £6000		7 10 0	
109	20	Barnstaple	20 0 0	7 10 0 & Bns.	
1158	2	Barton-on-Humber	2 0 0	5 0 0	2 0 0
120	25	Basingstoke	25 0 0	8 0 0	30 to 34
2500	16	*Bath*, A shares	16 0 0	8 0 0	} 38 0 0
2500	8	Do., B shares	8 0 0	7 0 0	} united
2500	10	Do., C shares	6 0 0	7 0 0	9 0 0
		Battle £2000		6 0 0	
56	26⅔	Bawtry	26 12 6	6 0 0	25 0 0
		Beaminster			
		Beaumaris			
710	10	*Beccles Gas & Water*. Bedale, Yorkshire.	10 0 0	2 10 0	
300	30	Bedford	25 0 0	4 0 0	20 0 0
350	10	Bedworth	10 0 0	7 0 0	11 10 0
300	3	Belford	3 0 0		1 10 0
350	10	Belper	10 0 0	10 0 0	14 0 0
		Berkeley			
		Berkhampstead			
1086	10	Berwick & Tweedmouth	10 0 0	7 0 0	12 10 0
		Bewdley			
200	10	Bicester	10 0 0	5 10 0	11 0 0
330	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
		Billericay			
5000	5	*Bilston*	5 0 0	8 0 0	7 0 0
200	10	Bingham	10 0 0	4 0 0	
		Bingley £7400		4 0 0	
1200	80	*Birmingham*, A shares	80 0 0	9 0 0	145 to 147
400	8	Do., B shares	8 0 0	9 0 0	14½ to 15
2500	40	Do., new shares	40 0 0	7 10 0	60¾ to 61¼
2400	50	*Birmingham & Staffordshire*	50 0 0	10 0 0	101 to 102
2400	25	Do., new shares	25 0 0	10 0 0	50½ to 51
7020	20	Do., do.	17 0 0	10 0 0	42 to 43
		Bishop's Auckland			
180	10	Bishop's Castle	10 0 0	5 0 0	10 0 0
230	10	Bishop's Stortford	10 0 0	5 0 0	10 0 0
6000	15	*Blackburn*	15 0 0	10 0 0	25 0 0
		Blandford			
		Blyth & Cowpen			
		Bodmin			
		Bognor			
100	10	Bolsover	10 0 0		10 0 0
3909	16½	*Bolton*	16 10 0	9 19 8	35 0 0
7466		Do., new shares	1 0 0		
800	10	*Boston*	10 0 0	8 10 0	
1200	10	Do., new shares		8 10 0	
		Boughton Blean			
193	10	Bourne	10 0 0	5 0 0	
160	10	Brackley	10 0 0	6 0 0	10 0 0
		Bradford, Wilts			
	25	*Bradford, Yorkshire*	25 0 0	10 0 0	49 0 0
		Braintree			
		Brampton, Cumberland			
		Brandon, Suffolk			
579	10	Brecon (Limited)	10 0 0	8 0 0	14 0 0
89700	Sk.	*Brentford*	All.	4 0 0	60 to 65
1659	20	Do., preference	1 0 0	5 0 0	
		Brentwood			
		Bridge, near Canterbury			
		Bridge-end, Glamorganshire			
200	50	*Bridgwater*	50 0 0	7 0 0	50 0 0
400	10	Bridlington	10 0 0	7 10 0	12 10 0
		Bridport			
6000	5	*Brierly Hill*	5 0 0	4 0 0	5 2 6
		Brigg			
		Brighouse			
3375	20	*Brighton*	20 0 0	7 0 6	21 7 6
1125	20	Do., new shares	16 0 0	6 0 0	15 to 17
2471	20	*Brighton & Hove*	20 0 0	6 0 0	19 to 21
107	8	Do., new shares			
181250	Sk.	*Bristol United*	Stock.	9 0 0	181 to 183
150	8	Brixham	8 0 0	5 0 0	
		Broadstairs			
1000	5	Bromley, Kent	5 0 0	7 0 0	
		Bromsgrove			
100	10	Bromyard (Limited)	10 0 0		
		Broughton			
120	10	Bruton	10 0 0	4 0 0	8 to 9
		Brynmawr			
100	25	Buckingham	25 0 0	6 0 0	26 to 27
500	1	Burley-in-Wharfdale (Limited)	1 0 0	5 0 0	1 1 0
		Burnham			
1600	5	*Burslem & Tunstall*	5 0 0	10 0 0	
2240	5	Do., new shares	5 0 0	7 10 0	
1200	10	*Bury St. Edmund's*	10 0 0	10 0 0	17 10 0
1800	10	Do., new shares	1 10 0	10 0 0	
303	10	Buxton (Limited)	10 0 0	7 10 0	14 0 0
150	10	Caistor	10 0 0	7 0 0	12 0 0
187	5	Callington	5 0 0		5 0 0
215	10	Calne, Wilts	10 0 0	6 0 0	10 0 0
		Camborne			
600	50	*Cambridge*	50 0 0	7 0 0	80 0 0
160	12½	Do., new shares	12 10 0	7 0 0	20 0 0
640	8½	Do., do.	4 0 0	7 0 0	6 0 0
240	50	*Canterbury Gas & Water*	50 0 0	} £6 &	61 to 63
240	25	Do., do.	25 0 0	} Bns.	25 to 30
240	12½	Do., do.	12 10 0	} of	12⅛ to 15
240	6¼	Do., do.	6 5 0	} £2.	6¼ to 7½
800	25	*Cardiff*, A shares	25 0 0	10 0 0	42 0 0
800	25	Do., B shares	25 0 0	8 0 0	38 0 0
160	25	Carmarthen	25 0 0	5 0 0	30 0 0
		Carnarvon			
		Carshalton			
200	6	Castlecary	6 0 0		5 0 0
200	10	Castle Donnington	10 0 0	6 0 0	12 14 0
249	5	Castleford	5 0 0	5 0 0	5 0 0
400	5	Castletown, Manchester	5 0 0	5 0 0	5¼ to 5½
620	2	Cawood (Limited)	2 0 0	4 0 0	
		Chatteris			
300	10	Cheadle	10 0 0	5 0 0	10 0 0
200	50	Chelmsford	50 0 0	8 0 0	70 0 0
200	25	Do., new shares	25 0 0	8 0 0	35 0 0
2500	16	*Cheltenham*, A shares	16 0 0	8 0 0	
2500	8	Do., B shares	8 0 0	7 0 0	
		Do., new shares		7 0 0	
500	10	*Chepstow*, A shares			
200	10	Do., B shares			
		Chertsey (*see* Co. & General, London)			
230	10	Chesham	10 0 0	5 0 0	10 10 0
300000	Sk.	*Chester United*	Stock.	5. 0 0	100 0 0
200001	,,	Do.	,,	7 0 0	140 0 0
465	10	Do.	10 0 0	7 0 0	14 0 0
35	10	Do., new shares	2 10 0	7 0 0	3 10 0
500	10	Do., do.	0 10 0	7 0 0	0 14 0
250	5	Chester-le-Street	5 0 0	6 0 0	5 0 0
192001	Sk.	*Chesterfield Gas & Water*		5 0 0	
400	50	Do.	50 0 0	5 0 0	52 0 0
240	25	Chichester	25 0 0	6 0 0	30 0 0
		Chippenham			
329	10	Chipping Norton (Limited)	10 0 0	5 0 0	
100	10	Chipping Ongar	10 0 0	2 10 0	5 0 0
838	20	Chorley	20 0 0	7 0 0	27 0 0
		Chowbent, Lancashire			
		Christchurch			
200	5	Church Stretton (Limited)	5 0 0		
680	10	Cirencester	10 0 0	5 0 0	11 0 0
357	10	Cleckheaton, A shares	10 0 0	5 0 0	
357	10	Do., B shares	7 10 0	5 0 0	
350	10	Clevedon	10 0 0	4 10 0	10 0 0
		Clitheroe			
1132	5	Cockermouth	5 0 0	5 0 0	5 5 0
300	5	Coggeshall	5 0 0		4¼ to 5
900	20	Colchester	20 0 0	7 0 0	24 0 0
		Coleford, Gloucestershire			
160	10	Collingham (Limited)	10 0 0	5 0 0	10 0 0
		Collumpton			
150	20	Colne, Lancashire	20 0 0		36 0 0
150	10	Do.	10 0 0	} £10	18 0 0
150	5	Do.	5 0 0		9 0 0
150	5	Do., A shares	5 0 0		9 0 0
150	5	Do., B shares	5 0 0		9 0 0
150	5	Do., C shares	2 0 0		5 0 0
200	25	*Congleton*	25 0 0	5 0 0	31 0 0
320	5	Conway (Limited)	5 0 0		5 0 0
		Corsham			
1600	25	*Coventry*	25 0 0	8 0 0	35 0 0
	25	Do., new shares	25 0 0	7 10 0	
		Cowbridge			
5000	10	Cowes	10 0 0	5 0 0	
		Cranbrook. £1900		5 0 0	
		Crayford & Bexley			
420		Crediton	5 0 0	5 0 0	6 0 0
		Crewe			
200	10	Croft & Hurworth-upon-Tees (Limited	9 0 0		
1200	1	Crook (Limited)	1 0 0	10 0 0	1 5 0
251	5	Crowland	5 0 0	7 0 0	
181	10	Crowle, Lincoln	10 0 0	10 0 0	
4000	5	*Croydon Commercial*	5 0 0	13 10 0	
250	20	Dartford	20 0 0	7 0 0	28 0 0
700	5	Dartmouth (Limited)	5 0 0	6 0 0	5 0 0
125	20	Daventry	20 0 0	5 0 0	24 8 0
165	10	Dawley	10 0 0	5 0 0	10 0 0
346	5	Dawlish	5 0 0	8 0 0	7 10 0
800	10	Deal & Walmer	10 0 0	7 10 0	10 0 0
1200	1	Deddington	1 0 0		
		Delph, Yorkshire			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
1070	25	*Derby*	25 0 0	10 0 0	55 10 0
		Dereham			
7000	5	*Devonport*	5 0 0	8 0 0	8 0 0
4000	5	*Dewsbury & Batley*	5 0 0	7 10 0	7 10 0
2000	5	Do., new shares	3 0 0	7 10 0	
		Dolgelly			
160	10	Donnington	10 0 0	5 0 0	10 0 0
340	25	Dorchester	25 0 0	8 0 0	27 0 0
120	25	Dorking	24 0 0	5 0 0	25 0 0
		Dorrington, Lincolnshire			
192	25	Douglas, Isle of Man	25 0 0	8 0 0	30 0 0
21945	Sk.	*Dover*	100 0 0	6 0 0	108 0 0
400	10	Do., new shares	5 0 0	6 0 0	6 0 0
500	10	Dowlais (Limited)	10 0 0	8 0 0	12 0 0
25	60	Downham Market	60 0 0	7 10 0	
		Driffield			
		Droitwich			
500	20	*Droylsden*	10 0 0		
600	30	*Dudley*	30 0 0	6 0 0	37 to 40
1500	20	*Dukinfield*	10 0 0	10 0 0	21 10 0
200	10	Dunmow	10 0 0	5 0 0	10 0 0
		Dunstable			
900	10	Durham	10 0 0	10 0 0	} £26
900	10	Do., new shares	5 10 0	10 0 0	
250	10	Dursley, Gloucestershire	9 0 0	6 0 0	9 5 0
150	5	Easingwold	5 0 0	5 0 0	
400	10	Eastbourne	10 0 0	5 0 0	11 0 0
90	20	East Dereham	20 0 0	5 0 0	21 0 0
356	5	East Grinstead	5 0 0	6 0 0	5 0 0
1200	5	East Retford	5 0 0	10 0 0	7 10 0
		Egremont, Cumberland			
703	6½	Elland	6 10 0	8 0 0	10 0 0
800	5	Elsecar (Limited)	5 0 0	5 0 0	5 12 0
		Eltham			
200	10	Emsworth			
400	5	Enfield	5 0 0	5 0 0	5 0 0
300	19	Epsom & Ewell	19 0 0		
		Eton (Cannel Gas)			
700	10	Evesham (Limited)	10 0 0	6 0 0	9¼ to 10
1600	25	*Exeter*	25 0 0	8 0 0	40 to 42
250	10	Exmouth	10 0 0	5 0 0	10 0 0
58	25	Eye	25 0 0	5 0 0	25 0 0
170	10	Fairford	10 0 0	3 0 0	
100	38	Fareham	38 0 0	5 0 0	
120	25	Farnham	25 0 0	10 0 0	42 0 0
		Farringdon			
		Faversham			
120	10	Fenny Stratford (Limited)	10 0 0	5 0 0	11 0 0
	5	Filey	5 0 0	5 0 0	5 0 0
300	10	Folkestone	10 0 0	10 0 0	15 0 0
240	10	Do., new	8 0 0	10 0 0	13 0 0
280	5	Framlingham	5 0 0	5 0 0	5 10 0
1155	1	Frodsham (Limited)	1 0 0	2 10 0	1 0 0
		Frome			
120007	Sk.	*Gainsborough*	All	6 0 0	110 to 115
400	20	Do., new shares	4 0 0	6 0 0	

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
170	10	Gillingham (Limited)			
		Dorset	10 0 0	3 0 0	
103	25	Glastonbury	25 0 0	4 0 0	15 0 0
		Glossop . £10,000		9 0 0	
1000	25	*Gloucester*, A shares	25 0 0	10 0 0	30 to 32
856	6¼	Do., B shares	6 5 0	7 10 0	7¼ to 7½
260	20	Godalming	20 0 0	5 0 0	20 0 0
300	5	Do., new shares	5 0 0	5 0 0	5 0 0
100	20	Do., do.	8 0 0		
100	5	Do., do.	2 0 0		
621	5	Gomersal	5 0 0	6 0 0	6 7 6
		Gorleston & Southdown			
		Gosport			
450	20	Grantham	20 0 0	7 0 0	28 0 0
1000	20	Gravesend	20 0 0	5 0 0	21 0 0
		Grays Thurrock			
643	5	Great Berkhampstead	5 0 0	6 0 0	5 10 0
1000	10	*Great Grimsby*	9 10 0	8 0 0	13 to 14
700	5	Great Harwood	5 0 0	4 5 0	
280	5	Do., new shares	1 0 0		
210	10	Great Marlow	10 0 0	5 0 0	10 0 0
		Great Torrington			
450	5	Great Wigston	5 0 0	6 0 0	
150	1	Do., new shares	1 0 0	6 0 0	
1300	10	Guernsey	9 0 0	16*s.* per share.	18 0 0
352	25	*Guildford*, A shares	25 0 0		
352	3	Do., B shares	3 0 0		
		Do., new shares			
		Guisborough			
		Gunislake			
		Hadlow (Limited)			
140	10	Hailsham	10 0 0	6 0 0	10 0 0
40	50	Halesowen	50 0 0	6 0 0	
900*l*	Sk.	Halesworth		7 10 0	
300	5	Do., new shares	5 0 0	7 10 0	6 0 0
240	5	Haltwhistle (Limited)	5 0 0	4 10 0	5 0 0
		Hampton			
1000	10	*Harrogate*	8 15 0	5 0 0	8 15 0
6800	5	*Hartlepool Gas & Water*	5 0 0	7 0 0	7 12 6
3322	5	Do., new shares	5 0 0	7 0 0	7 0 0
9878	5	Do., do.	1 10 0	7 0 0	
		Harwich			
662	6	Haslingden	6 0 0	10 0 0	10 0 0
343	6	Do., A shares	4 0 0	10 0 0	6 0 0
1120	25	*Hastings & St. Leonards*	25 0 0		
180	10	Hatfield			
500	5	Havant	5 0 0	3 0 0	5 0 0
120	10	Haverhill	10 0 0	5 0 0	10 0 0
244	5	Haworth	5 0 0		5 5 0
		Hay, Brecon			
		Haydon Bridge			
4965	1	Hebden Bridge	1 0 0		
120	10	Hedon (Limited)	10 0 0	3 0 0	
145	12	Helston	12 0 0	9 0 0	
250	10	Hemel Hempstead	10 0 0	4 0 0	7 0 0
300	10	Henley (Limited)	10 0 0		
		Hereford. £10,000		4 10 0	
300	10	Herne Bay	10 0 0	6 0 0	11 0 0
		Hertford			
270	10	Hexham	10 0 0	6 0 0	14 0 0
400	25	*Heywood*	25 0 0	10 0 0	
	25	Do., new shares	25 0 0	7 10 0	
160	10	Higham Ferrers	10 0 0	7 0 0	12 0 0
		Highworth, Wiltshire			
520	5	High Wycombe	5 0 0	6 0 0	6 16 0
280	10	Hinckley	10 0 0	5 0 0	9 0 0
		Hindley, Lancashire			
200	20	Hitchin	20 0 0	8 0 0	
200	5	Do., new shares	5 0 0	8 0 0	
		Hoddesden			
555	20	*Holmfirth*	19 0 0	5 0 0	19 0 0
960	5	Holyhead	5 0 0	6 0 0	6 2 6
		Holywell (*see* British Provincial)			
98	25	Honiton	25 0 0	3 12 0	20 0 0
1250	1	Honley (Limited)	1 0 0	5 0 0	1 0 0
		Horbury			
6	500	Horncastle	£500		
1200	2½	Horsforth	2 10 0		2 10 0
142	20	Horsham	20 0 0	10 0 0	25 0 0
	10	Houghton-le-Spring	10 0 0	8 0 0	
		Howden			
1450	20	Huddersfield	20 0 0	10 0 0	
	20	Do., new shares	15 0 0	5 0 0	
		Hull			
		Hull-Sculcoates (*see* British Provincial)			
210	10	Hungerford	10 0 0	5 0 0	10 0 0
250	10	Huntingdon & Godmanchester	10 0 0	4 0 0	10 0 0
860					
600	10	Huyton & Roby	10 0 0	4 0 0	
2500	10	*Hyde*	9 0 0	5 10 0	10 15 0
400	10	Hythe & Sandgate (Limited)	10 0 0	6 0 0	10 15 0
		Idle & Eccleshill			
		Ilford			
198	12	Ilfracombe	12 0 0	4 0 0	8 to 9
560	6¼	Ilkeston	6 5 0	11 4 0	8 0 0
		Ilkley			
		Ilminster			
		Ingatestone			
2800	10	*Ipswich*	10 0 0	8 0 0	15 to 16
		Ironbridge			
180	10	Irthlingborough	10 0 0	5 0 0	10 0 0
800	25	*Isle of Thanet* (Margate & Ramsgate.)	20 0 0	5 0 0	31 to 33
		Jersey, St. Helier's			
363	5	Kelvedon (Limited)	5 0 0		
1842	9	*Kendal Union Gas & Water*	9 0 0	7 0 0	12 10 0
380	20	Do., preference	20 0 0	7 10 0	35 0 0
290	10	Kenilworth (Limited)	10 0 0	4 0 0	10 0 0
400	5	**Kes**wick	5 0 0	5 0 0	4 0 0
200	25	Kettering	25 0 0	6 0 0	30 0 0
		Keynsham			
		Kidderminster, £10,000.		5 0 0	
		Kidsgrove			
150	10	Kimbolton	10 0 0	7 0 0	12 0 0
140	7	Kingsbridge	7 0 0		10 to 11
		King's Cliff			
		Kingston-on-Thames.			
		Kington, Hereford			
		Kirby Lonsdale			
		Kirkburton			
330	5	Kirkham, Lancashire	5 0 0	4 0 0	5 0 0
330	2½	Do., new shares	2 10 0	4 0 0	2 10 0
200	10	Kirton-in-Lindsey (Limited)	10 0 0	5 0 0	10 10 0
200	5	Knighton	5 0 0		
1000	10	*Knottingley*			
470	31½	*Lancaster*	31 10 0	7 2 10	45 to 46
470	6 gs.	Do.	6 6 0	7 2 10	9 to 9½
564	15⅔	Do.	15 15 0	5 0 0	21 to 22
50	25	Langport	25 0 0	4 0 0	15 0 0
		Launceston			
1000	20	*Leamington Priors*	20 0 0	8 0 0	25 0 0
250	20	Do., new shares	15 0 0	5 0 0	17 0 0
213	10	Leatherhead	10 0 0	5 0 0	10 0 0
		Ledbury			
		Leeds Old Company—			
2412	25	Old shares	25 0 0	10 0 0	46 to 47
951	25	New do.	25 0 0	6 0 0	29 to 30
		Leeds New Company—			
45000*l*		Old stock	£100	10 0 0	173—175
35000*l*		New do.	£100	6 0 0	115—117
7795	6¼	Do., shares	3 15 0	6 0 0	4¼ to 4⅜
3900	10	*Leicester*	10 0 0	8 0 0	16¼ to 16⅜
		Leigh			
21		Leighton Buzzard	21 0 0	7 0 0	25 0 0
10½		Do., new shares	10 10 0	7 0 0	12 10 0
400	10	Leominster	10 0 0	5 0 0	8 10 0
330	25	Lewes, A shares	25 0 0	9 0 0	30 0 0
644	5	Do., B shares	5 0 0	9 0 0	6 0 0
245	5	Leyburn, Yorkshire	5 0 0		6 0 0
		Leyland, Lancashire			
250	20	Lichfield	20 0 0	10 0 0	40 0 0
320	25	*Lincoln*	25 0 0	10 0 0 & Bns. of 12/6	70 0 0
300	5	Lindfield (Limited)	5 0 0		5 0 0
240	5	Liskeard	5 0 0	8 0 0	6 0 0
240	5	Littlehampton	5 0 0	7 10 0	5 0 0
100		*Liverpool United*	£100	10 0 0	200 0 0
25		Do., ¼ share	25 0 0	10 0 0	50 0 0
		Llandudno Gas & Water			
		Llanelly . . £3000		5 0 0	
		Llangollen			
250	10	Llanrwst (Limited)	9 15 0	5 0 0	9 15 0
		—			
		LONDON COMPANIES.			
5000	10	Anglo-Romano (*en commandite*)	10 0 0	8 0 0	10 to 12
5000	20	British Provincial	20 0 0	7 0 0	26 to 27
	20	Do., new	16 0 0	7 0 0	18 to 19
		(Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)			
12000	50	*Chartered*	50 0 0	9 0 0	65 to 67
6000	50	Do.	10 0 0	9 0 0	12¼ to 13⅛
10000	20	*City of London*, A shares	20 0 0	7 0 0	23 to 25
10000	10	Do., B shares	10 0 0	4 0 0	7 to 8
10000	10	Do., new shares	5 0 0	7 0 0	6¼ to 7⅛
10000	25	*Commercial*	25 0 0	6 0 0	29 to 30
6000	25	Do., new shares	7 10 0	6 0 0	9 to 10
1180	5	County & General (Limited)	5 0 0	5 0 0	
2000	5	Do., preference	5 0 0	6 0 0	
		(Pembroke, Chertsey, Lea Bridge, Northfleet, Walton, & Ware.)			
4909	10	*Crystal Palace District*	10 0 0	} £7 &	11 to 12
91	10	Do.	2 0 0	} Bns.	
4000	50	*Equitable*	50 0 0	7 0 0	60 to 62
23406	10	European (Lim.)	10 0 0	9 0 0	11¼ to 11⅝
		(Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)			
17216	10	*Great Central Gas Consumers*	10 0 0	6 0 0	10 to 10¼
13000	50	*Imperial*, old shares	50 0 0	10 0 0	82 to 84
13000	50	Do., new shares	27 10 0	10 0 0	51 to 52
1300	100	Do., bonds	£100	10 0 0	200 to 210
28000	50	*Imperial Continental*	43 5 0	7 0 0	47 to 49
		(Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Marseill. Toulouse, Vienna.)			
3000	40	*Independent*	40 0 0	5 0 0 & Bns.	58 to 62
4904	50	*London*	50 0 0	5 0 0	57 to 59
5519	25	Do., 1st pref.	25 0 0	6 0 0	29 to 30
1921	50	Do., 2nd pref.	50 0 0	6 0 0	57 to 59
870	50	Do., 3rd pref.	50 0 0	6 0 0	55 to 57
204551		Do., 1st pref. sk		6 0 0	
136081		Do., 2nd pref. sk		6 0 0	
50000	1	Oriental (Limited), Calcutta	1 0 0		¾ to 1¼
50000	1	Do., new shares	0 15 0		¾ to ⅞
9000	60	*Phœnix*	53 0 0	7 0 0 & Bns.	67 to 70
5000	20	*Ratcliff*	16 0 0	5 0 0 & Bns.	16 to 17
4000	50	*South Metropolitan*	38 0 0	6 0 0 & Bns.	50 to 52
12633	10	*Surrey Consumers*	10 0 0	8 0 0	12 to 12¼
2147	10	Do.	2 0 0	8 0 0	2 5 0
9000	50	United General (Dublin & Limerick)	50 0 0	2 10 0	21¼ to 22¼
10000	10	*Victoria Docks*			
1500	10	*Wandsworth & Putney*	10 0 0		
1500	10	Do., new shares			
20000	10	Western (Limited) A shares	10 0 0	9 0 0	15 to 15½
10000	10	Do., B shares	1 0 0	9 0 0	2¼ to 2⅜
2777	5	*West Ham*	5 0 0		
13223	5	Do., new shares			
		—			
		Londonderry			
		Long Buckby (Limited)			
120	10	Long Sutton (Limited)	10 0 0	7 10 0	11 to 12
		Longton (Limited)			
250	5	Lostwithiel	5 0 0		6 0 0
250	1	Do.	1 0 0		1 0 0
		Loughborough			
240	25	*Louth*	25 0 0	10 0 0	
2500	10	*Lowestoft Gas & Water*			
611	5	Ludlow Union	5 0 0	5 0 0	5 to 5¼
110	5	Do., pref. shares	5 0 0	5 0 0	
640	10	*Luton*	10 0 0		
640	5	Do., preferential	5 0 0		
640	5	Do., new shares	2 10 0		
100	20	Lutterworth	20 0 0	6 5 0	25 0 0
63	20	Lyme Regis	20 0 0	4 0 0	20 0 0
120	25	Lymington	25 0 0	5 0 0	25 0 0
		Macclesfield, £32,000.			
300	10	Maidenhead	10 0 0	5 0 0	10 0 0
500	25	*Maidstone*, A shares	25 0 0	10 0 0	45 0 0
500	25	Do., B shares	25 0 0	4 0 0	20 0 0
	25	Do., new shares	25 0 0	7 10 0	
204	23	Maldon	23 0 0	7 0 0	27 0 0
200	10	Malmesbury	10 0 0	2 10 0	5 15 0
		Manningtree			
		Mansfield . £5000		10 0 0	
150	10	Mansfield Woodhouse	10 0 0		
		March			
		Margate (*see* Isle of Thanet)			
		Market Drayton			
132	25	Market Harboro'	25 0 0	7 0 0	35 0 0
		Market Weighton			
		Markyate Street (Limited)			
		Marlborough			
150	10	Marsden (Limited)	10 0 0	5 0 0	10 0 0
370	10	Maryport	10 0 0	6 0 0	12 0 0
500	5	Matlock Baths	5 0 0		
200	2	Measham (Limited)	1 12 6	5 0 0	
		Melbourne			
		Melksham			
934	2	Meltham	2 0 0	4 10 0	
		Melton Mowbray			
50	10	Mere	10 0 0		
		Merthyr Tydvil			
120	10	Middleham	10 0 0	5 0 0	10 0 0
3000	10	*Middleton*		10 0 0	
		Midsummer Norton			
198	5	Mildenhall	5 0 0	5 0 0	
2000	5	*Mirfield*	5 0 0	5 0 0	6 5 0
700	10	Mitcham	10 0 0	10 0 0	14 10 0
650	5	Mold Gas & Water	5 0 0	7 10 0	6¼ to 6½
700	10	Monmouth Gas & Water	10 0 0	5 0 0	10 0 0
250	5	Montgomery (Limited)	5 0 0		
150	10	Moreton-in-Marsh	9 2 6	4 0 0	9 2 6
1000	5	Morley, near Leeds	5 0 0	6 0 0	6 15 0
220	16	Morpeth	16 0 0	5 0 0	17 10 0
		Mossley			
		Mottram			
		Nantwich			

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Nayland			
		Neath			
185	10	Needham Market	10 0 0	4 0 0	
		Newark £5000		10 0 0	
		Newburn			
250	20	Newbury	20 0 0	5 0 0	28 0 0
16000	8	Newcastle & Gateshead Union	8 0 0	7 0 0	10 0 0
		Newcastle-under-Lyne £6200		4 0 0	
250	5	Newent	5 0 0		
		Newhaven, Sussex			
		New Malton			
600	5	Newmarket	5 0 0	4 0 0	4 0 0
366	2	Do., preference	2 0 0	6 0 0	2 0 0
200	20	*New Mills & Hayfield*	15 10 0	5 0 0	
70	20	Newnham (Limited)	20 0 0		21 0 0
		Newport Pagnell			
360	35	*Newport, Monmouth*, A shares	35 0 0	9 0 0	50 0 0
540	35	Do., B shares	35 0 0	7 10 0	42 10 0
		Newport, Salop			
250	5	New Romney (Limited)	5 0 0	5 0 0	5 0 0
		Newton Abbott			
198	10	Newtown, Montgomeryshire	10 0 0	6 0 0	10 0 0
		Northallerton			
777	20	*Northampton*, A shares	20 0 0	10 0 0	
777	20	Do., B shares	20 0 0	4 0 0	
777	20	Do., C shares	10 0 0	7 10 0	
		Northfleet (*see* Co. & General)			
2914	5	N. Shields, Tynemouth	5 0 0	5 0 0	6 to 6½
120	10½	North Walsham	10 10 0	5 0 0	10 15 0
371	15	Northwich	15 0 0	5 0 0	15 0 0
		Norwich (*see* Brit. Provincial)			
4000	50	*Nottingham*	50 0 0	5 0 0	
	50	Do., new shares	50 0 0	10 0 0	
268	8	Nuneaton (Limited)	8 0 0	5 0 0	7 10 0
125	8	Do.	8 0 0	5 0 0	7 10 0
		Oaken Gates, Salop			
240	5	Oakhampton (Limited)	5 0 0		
200	10	Odiham	10 0 0	5 0 0	10 0 0
		Olney			
360	10	*Ormskirk*, old shares	10 0 0	8 0 0	14 0 0
1080	10	Do., new shares	4 10 0	8 0 0	6 4 6
1600	5	*Ossett & Horbury*	5 0 0	5 0 0	5 10 0
800	5	Do.	4 5 0	5 0 0	
		Otley, Yorkshire			
80	25	Oundle	25 0 0	7 0 0	25 0 0
		Over Darwen, £8000		5 0 0	
1694	1	Over & Wharton (Limited)	1 0 0		1 2 0
120	150	*Oxford*	£150	9 6 8	240 0 0
		Padiham			
		Paington (Limited)			
		Painswick			
		Pately Bridge, Yorkshire			
300	5	Peel, Isle of Man	5 0 0	7 0 0	6 to 7
		Pembroke (*see* Co. & General)			
500	20	*Peniston, Thurlstone, & Ozspring*			
250	20	Penrith	15 0 0	6 10 0	21 0 0
153	20	Penzance	20 0 0		15 0 0
320	5	Petersfield	5 0 0	5 0 0	
200	10	Petworth	10 0 0	9 0 0	14 0 0
		Pickering			
2500	10	*Plymouth & Stonehouse*	10 0 0	10 0 0	18 0 0
		Do.	8 0 0	7 10 0	11 0 0
160	10	Pocklington	10 0 0		5 0 0
		Ponder's End & Enfield Highway (Limited)			
		Pontefract			
		Pontypridd		4 0 0	
400	10	Poole	10 0 0	10 0 0	15 0 0
344	2	Do.	2 0 0	10 0 0	3 0 0
		Port Madoc	53 0 0		
600	53	*Portsea Island*	50 0 0	6 0 0	66 to 69
600	50	Do.		6 0 0	62 to 65
120	10	Potton, Bedfordshire	10 0 0	5 0 0	10 0 0
400	10	Prescott	10 0 0	5 0 0	
		Presteign			
60000	Sk.	*Preston*	All.	10 0 0	200 0 0
3000	20	Do.	11 0 0	10 0 0	23 0 0
1000	10	Provincial (Hull)	8 0 0		8 0 0
600	20	*Pudsey*	20 0 0	7 10 0	30 0 0
600	6⅔	Do., new shares	4 13 4	7 10 0	4 13 4
93	20	Pwllheli	20 0 0	2 10 0	25 0 0
600	5	Quorndon & Mountsorrel	5 0 0	7 0 0	12 0 0
900	10	*Radcliff & Pilkington*, No. 1	10 0 0		
2100	10	Do., No. 2	6 0 0		
200	20	Ramsay, Isle of Man	20 0 0	5 0 0	22 10 0
		Ramsgate (*see* Isle of Thanet)			
		Rawmarsh			
1019	10	*Reading*	10 0 0	6 0 0	9 0 0
500	20	*Reading Union*	20 0 0	7 10 0	21 0 0
400	5	Redcar	5 0 0		
		Redruth			
		Reigate			
1200	1	Repton (Limited)	1 0 0	5 0 0	1 1 0
2000	10	Richmond, Surrey (Limited)	10 0 0	7 0 0	15 0 0
400	5	Rickmansworth	5 0 0		5 0 0
180	10	Ringwood	10 0 0	5 0 0	10 0 0
180	33⅓	Ripon	33 10 0	4 10 0	
		Rochdale			
		Rochester & Chatham £20,000		6 0 0	
		Rochford			
		Romford			
200	25	Romsey			
		Rotherham, A shares	25 0 0	8 0 0	36 0 0
200	12½	Do., B shares	12 10 0	8 0 0	18 0 0
600	12½	Do., C shares	8 0 0	8 0 0	11 0 0
600	20¾	Do., D shares	2 10 0	8 0 0	3 10 0
		Rothwell			
350	10	Royston	10 0 0	5 0 0	9 10 0
150	20	Rugby	20 0 0	10 0 0	
150	5	Do.	5 0 0	10 0 0	
150	6⅔	Do.	6 13 4	10 0 0	
150	10	Do., new shares	10 0 0	10 0 0	
150	2½	Do., do.	2 10 0	10 0 0	
150	3⅓	Do., do.	3 6 8	10 0 0	
430	10	Rugely	10 0 0	5 0 0	10 10 0
		Runcorn £11,000		7 10 0	
114	31½	Ruthin	31 5 0	6 16 0	40 0 0
500	10	Ryde	10 0 0	6 0 0	12 0 0
		Rye			
		Saddleworth			
225	22	Saffron Walden	22 0 0	4 0	16 to 18
1400	5	St. Alban's Gas & Water (Limited)	5 0 0	5 0 0	5 5 0
320	5	St. Asaph (Limited)	5 0 0		
		St. Austel			
		St. Colomb			
3000	10	*St. Helen's*	10 0 0	10 0 0	
		St. Ives, Cornwall			
180	10	St. Neot's	10 0 0	8 0 0	12 0 0
400	25	Salisbury	25 0 0	6 0 0	28 0 0
		Sandbach			
381	10	Sandwich	10 0 0	5 0 0	9 10 0
100	10	Saxmundham	10 0 0	5 0 0	
2000	10	*Scarborough*	10 0 0	10 0 0	18 0 0
	10	Do., preference	10 0 0	6 0 0	
240	5	Sedburgh	5 0 0		
300	16	Selby	16 0 0	5 0 0	
140	5	Settle (Limited)	3 10 0	5 0 0	
290	10	Sevenoaks	10 0 0	4 0 0	10 0 0
300	10	Shaftesbury (Limited)	10 0 0	5 0 0	8½ to 9
565	5	Sheepshed (Limited)	5 0 0	6 0 0	6 0 0
		Sheerness			
135000	Sk.	*Sheffield United*, A shares	All.	10 0 0	192 0 0
39264	Sk.	Do., B shares	All.	8 0 0	162 0 0
4800	16 gs.	Do., D shares	9 0 0	8 0 0	8 7 6
1600	6 gs.	Do., E shares	3 7 6	8 0 0	3 2 6
600	5	Shefford (Limited)	4 0 0		
		Shelton, Potteries (*see* British Provincial)			
350	10	Shepton Mallet	10 0 0	7 10 0	10 0 0
800	5	Sherborne	5 0 0	7 10 0	5 0 0
		Shields			
		Shiffnal, Salop			
1000	5	*Shipley*	5 0 0	6 0 0	7 10 0
150	10	Shipston-on-Stour	10 0 0	4 0 0	
		Shirley & Freemantle			
240	25	Shotley Bridge (Limited)	25 0 0	7 0 0	30 0 0
240	10	Do., new shares	10 0 0	7 0 0	12 0 0
1000	10	*Shrewsbury*, A shares	10 0 0	100 0	22 0 0
1000	10	Do., B shares	10 0 0	5 0 0	11 0 0
530	10	Do., new shares	10 0 0	7 10 0	15 0 0
400	15	Skipton	15 0 0	5 0 0	18 0 0
400	2½	Do., new shares	2 10 0	5 0 0	3 0 0
250	20	Sleaford	20 0 0	5 0 0	20 0 0
250	10	Slough	10 0 0		
340	5	Snaith	5 0 0		4 0 0
		Soham			
150	10	Somerton	10 0 0		
354	5	Southam	5 0 0		
1000	50	*Southampton*	50 0 0	6 0 0	
		Southend, Essex			
220	10	South Molton	10 0 0	5 10 0	7 10 0
2000	10	*South Shields*	10 0 0	7 0 0	10 11 6
248	10	Southwell (Limited)	10 0 0	5 0 0	11 to 11½
300	5	Southwold	5 0 0	5 0 0	5 0 0
		Sowerby Bridge, Yorkshire			
1470	1	Spennymoor (Limited)	1 0 0		
400	5	Spilsby	5 0 0		
		Spittal, Berwick-on-Tweed			
2000	6⅔	*Stafford*	6 13 4	6 10 0	9 10 0
2000	6⅔	Do., new shares	4 0 0	6 10 0	5 0 0
178	5	Staindrop	5 0 0	6 0 0	5 0 0
248	25	Staines & Egham	25 0 0	6 0 0	26 to 27
		Staley Bridge, £15,000		10 0 0	
225	50	*Stamford & St. Martin's*	50 0 0	8 0 0	45 to 50
150	10	Staveley (Limited)	10 0 0	5 0 0	11 10 0
300	5	Stevenage	5 0 0	5 0 0	5 0 0
		Stoke-upon-Trent			
2000	10	*Stoke Fenton & Longton*	10 0 0	7 0 0	12 0 0
400	5	Stone, Stafford	5 0 0	5 0 0	6 0 0
220	10	Stoney Stratford	10 0 0	4 10 0	9 0 0
		Stourbridge, £5000			
		Stow-on-the-Wold			
150	20	*Stratford-on-Avon*	20 0 0	8 0 0	34 0 0
150	5	Do., new shares	5 0 0	8 0 0	8 10 0
750	5	Stretford	5 0 0	6 0 0	5 0 0
		Stroud			
169	10	Swaffham	10 0 0	5 0 0	7 0 0
		Swansea £9000			
261	20	Sudbury	20 0 0	5 0 0	20 0 0
18120	5	*Sunderland*	5 0 0	7 10 0	7¼ to 7⅞
1000	5	Do., new shares	5 0 0	7 10 0	7¼ to 7⅞
200	10	Sutton Coldfield, (Limited)	10 0 0		10 0 0
350	10	Sutton-in-Ashfield	10 0 0	7 10 0	12 10 0
		Sutton Southcoates			
		Sutton, Surrey & Drypool, Hull	20 0 0		23 to 24
		Swindon			
200	10	Swineshead (Lim.)	10 0 0	5 0 0	10 5 0
180	10	Syston	10 0 0		10 0 0
276	5	Tadcaster	5 0 0	5 0 0	3 0 0
		Tamworth			
		Tattershall & Coningsby (Lim.)			
2800	5	*Taunton*	5 0 0	6 0 0	6 0 0
2800	1½	Do., new shares	1 10 0	6 0 0	
		Tavistock			
200	5	Tenbury Union	5 0 0	5 0 0	5½ to 6
150	10	Tenterden	10 0 0	4 0 0	8 0 0
		Tetbury, Gloster			
		Tewkesbury			
200	10	Thame	10 0 0	5 0 0	10 0 0
250	10	Thetford	10 0 0	6 0 0	10 to 11
150	10	Thornbury (Lim.)	10 0 0	4 0 0	
80	1	Do., new shares	1 0 0	4 0 0	
356	5	Thorne	5 0 0		4 0 0
160	10	Thrapston (Lim.)	10 0 0	5 0 0	10 0 0
1885	5	Todmorden (Lim.)	5 0 0	10 0 0	8 to 9
600	2½	Topsham (Lim.)	2 10 0	5 0 0	
		Torpoint (Lim.)			
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes Consumers			
4000	5	*Tottenham & Edmonton*	3 15 0	8 0 0	4 0 0
150	10	Towcester	10 0 0	5 0 0	10 0 0
		Town-Malling			
275	10	Tring	10 0 0	5 0 0	10 0 0
		Trowbridge (*see* Brit. Prov.)			
320	25	Truro	25 0 0	7 0 0	
		Tunbridge			
		Tunbridge Wells			
100	10	Tuxford	10 0 0	5 0 0	12 0 0
600	5	Tyldesley (Lim.)	5 0 0	7 10 0	7 0 0
		Ulverston			
		Uppingham			
240	5	Upton-on-Severn	5 0 0	5 0 0	5 0 0
310	5	Usk (Limited)	5 0 0	7 0 0	6 12 6
250	10	Uttoxeter	10 0 0	5 0 0	11 to 12½
		Uxbridge			
586	10	Ditto & Hillingdon Consumers	10 0 0		
		Ventnor			
160	10	Wainfleet (Lim.)	10 0 0		8 0 0
1000	25	*Wakefield*	25 0 0	10 0 0	40 0 0
3660	5	Do.,	5 0 0	10 0 0	8 0 0
1732	5	Do., new shares	5 0 0	7 10 0	
300	10	Wallingford	10 0 0	5 0 0	8 0 0
200	10	Wantage	9 0 0	5 0 0	10 10 0
100	10	Wareham	10 0 0	3 10 0	8 0 0
2000	1	Warkworth and Amble	1 0 0	3 10 0	
160	25	Warminster	25 0 0	6 0 0	28 0 0
900	20	*Warrington*	20 0 0	10 0 0	39 0 0
900	20	Do., new shares	13 0 0	10 0 0	24 0 0
		Warth			
		Warwick £15,000		6 0 0	
		Watford			
400	10	Weedon (Limited)	10 0 0	8 10 0	15 0 0
400	3	Do., new shares	1 10 0	8 10 0	2 5 0
111	25	Welchpool, Montg.	25 0 0	5 0 0	25 0 0
		Wellingborough			
300	10	Wellington, Salop	10 0 0	7 10 0	12 0 0
		Wellington, Som.			
160	25	*Wells*, Somerset	25 0 0	10 0 0	
160	10	Westbury	10 0 0		
		West Cowes			
225	10	Westerham (Lim.)	10 0 0	5 0 0	11 0 0
454	5	West Malling	5 0 0		3 4 0
400	20	*Weston-sup-Mare*	20 0 0	6 10 0	
200	5	Wetherby	5 0 0		1 10 0
2000	10	*Weymouth*			
2300	1	Whitchurch, Hants (Limited)	0 10 0	2 10 0	
400	25	Whitehaven	25 0 0	2 0 0	14½ to 15
		Whitehaven New			
		Whitstable			
250	10	Whittlesea	10 0 0	5 0 0	11 0 0
300	10	Whitwick & Coalvle	10 0 0		10 0 0
		Whitworth Vale (Limited)			
		Widnes Gas & Wr.			
1216	10	*Wigan*	10 0 0	10 0 0	22 0 0
400	5	Wigston	5 0 0	6 0 0	5 0 0
		Wigton, Cumberland			
1020	5	*Willenhall*, A shares	5 0 0		
1020	54s.	Do., B shares	2 14 0	5 0 0	
		Do., new shares			
		Wilton			
600	10	Wimbledon	8 0 0		8 0 0
240	10	Wimborne Minster	10 0 0		
130	10	Wincanton	10 0 0	7 0 0	
380	50	Winchester	50 0 0	5 0 0	50 0 0
1000	20	Windsor (Limited)	20 0 0	7 10 0	25 0 0
141	10	Winslow	10 0 0	6 0 0	10 0 0

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
120	10	Winterton (Lim.)	10 0 0	5 0 0	
120	5	Do., new shares	5 0 0	5 0 0	
200	10	Wirksworth	10 0 0	5 0 0	10 0 0
		Wisbeach			
		Witham			
		Witney			
400	5	Wiveliscombe(Ld.)	5 0 0	6 0 0	5 5 0
200	10	Woburn	10 0 0	5 0 0	11 0 0
210	10	Wokingham	10 0 0	5 0 0	
4448	10	*Wolverhampton*	10 0 0	10 0 0	19¾ to 20¼
4448	10	Do., new shares	6 0 0	10 0 0	13¾ to 14
556	10	Woodbridge(Lim.)	10 0 0		
660	2½	Woodstock	2 10 0	5 0 0	
		Woohouses			
200	7	Wooler	7 0 0		
		Woolwich Comrs.			
		Woolwh. Equitable			
2400	10	*Worcester*	10 0 0	7 0 0	14 7 6
600	10	*Worksop*	10 0 0	5 0 0	
600	5	Do., new shares	5 0 0	5 0 0	
		Worthing			
270	12	Wotton-un.-Edge	12 0 0	4 0 0	7 0 0
600	5	Wrexham, A sh.	5 0 0	7 10 0	5 0 0
600	5	Do., B shares	5 0 0	5 0 0	5 0 0
600	5	Do., C shares	3 10 0	5 0 0	3 10 0
		Wye, Kent			
		Wylam			
		Wymondham			
795	20	Yarmouth	20 0 0	5 0 0	18 to 20
1675	4	Yeadon, nr. Leeds	4 0 0	6 5 0	4 5 0
140	30	Yeovil	30 0 0	6 0 0	30 0 0
140	10	Do., new shares	10 0 0	6 0 0	10 0 0
12000	5	*York United*	5 0 0	8 0 0	9 0 0
3000	5	Do., new shares	1 0 0	8 0 0	3 0 0
		SCOTLAND.			
26000	2½	Aberdeen	2 10 0	10 0 0	5 1 0
		Abernethy			
500	10	Airdrie	10 0 0	9 0 0	14 10 0
		Alloa			
		Alyth			
600	5	Annan	5 0 0	5 0 0	5 0 0
1600	1	Anstruther & Cellardyke	1 0 0	8 0 0	1 6 0
825	20	Arbroath	20 0 0	7 10 0	31 0 0
100	20	Ardrossan	20 0 0	5 0 0	20 0 0
658	1	Auchinleck	1 0 0		
381	5	Auchterarder	5 0 0	7 10 0	7 10 0
750	2	Auchtermuchty	2 0 0	6 0 0	2 10 0
2666	5	Ayr	5 0 0	6 0 0	6 0 0
3000	2	Ayr&NewtonCons.	2 0 0	6 0 0	2 0 0
300	10	Banff	10 0 0	6 0 0	11 0 0
		Barrhead			
		Bathgate			
		Beith			
976	1	Bervie	1 0 0	5 0 0	
		Biggar			
739	5	Blairgowrie	5 0 0	8 0 0	7 0 0
		Borrowstowness			
540	5	Brechin	5 0 0	9 0 0	9 15 0
		Bridge of Allan			
2272	2	Broughty Ferry	2 0 0	7 10 0	2 7 6
		Campbelton			
250	4	Carluke, Lanark	4 0 0	7 10 0	4 0 0
		Clackmannan			
1666	3	Coatbridge	3 0 0	10 0 0	4 5 0
200	5	Coldstream	5 0 0	6 0 0	5 0 0
		Collinsburgh			
1000	1	Comrie	1 14 8	4 10 0	1 14 8
1200	1	Crail, Fife	1 0 0	5 0 0	1 0 0
2744	1	Crieff	1 0 0	10 0 0	1 15 0
600	1	Cullen	1 0 0	5 0 0	0 15 0
280	2½	Cumbernauld	2 10 0	5 0 0	2 10 0
200	5	Cumnock	5 0 0	6 0 0	6 0 0
600	5	Cupar Angus	5 0 0	7 0 0	6 10 0
250	10	Cupar Fife	10 0 0	10 0 0	18 10 0
300	10	Dalkeith	10 0 0	7 10 0	20 10 0
		Deanston			
750	2	Denny	2 0 0	6 5 0	2 5 0
	5	Dornoch			
500	1	Douglas	1 0 0	6 0 0	1 2 0
		Dufftown			
		Dumbarton			
400	20	Dumfries	14 0 0	7 2 10	14 10 0
391	5	Dunbar	5 0 0	6 0 0	5 10 0
		Dunblane			
1250	25	*Dundee*	23 15 0	8 15 9	50 0 0
8000	5	*Dundee, New*	5 0 0	4 10 0	5 5 0
860	10	Dunfermline	10 0 0	7 10 0	16 10 0
		Dunkeld			
1750	2	Dunoon	2 0 0	6 0 0	2 3 0
		Dunse			
250	5	Dysart	5 0 0	7 10 0	6 10 0
2327	1	East Wemyss	1 0 0	6 0 0	1 2 0
		Ecclefechan			
6000	25	*Edinburgh*	25 0 0	10 0 0	54 0 0
6400	25	*Edinburgh & Leith*	25 0 0	10 0 0	53 0 0
621	12	Elgin	12 0 0	6 0 0	13 0 0
		Elie			
		Errol			
		Eyemouth			
	14	Falkirk	14 0 0	7 0 0	14 0 0
		Falkirk, New			
632	2	Falkland	2 0 0	5 0 0	2 0 0
2000	1	Ferry Porton Craig	1 0 0	6 5 0	1 3 0
581	1	Fochabers	1 0 0	5 0 0	1 2 0
1440	5	Forfar	5 0 0	7 10 0	7 12 6
360	5	Do., new shares	2 10 0	7 10 0	6 10 0
		Fort William			
2000	1	Fraserburgh	0 16 0	5 0 0	0 18 0
500	5	Galashiels	5 0 0	10 0 0	9 10 0
		Gatehouse, n. Fleet			
900	2½	Girvan	2 10 0	6 0 0	2 10 0
5200	25	*Glasgow*	25 0 0	10 0 0	48 5 0
3200	6½	Do.	6 5 0	10 0 0	12 1 3
15000	10	*Glasg. City & Sub.*	10 0 0	10 0 0	19 7 6
		Grahamston			
		Grangemouth			
		Haddington			
		Hamilton			
	5	*Hamilton, New*	5 0 0	4 10 0	6 0 0
440	5	Hawick	5 0 0	7 10 0	7 10 0
300	5	Helensburgh	5 0 0	7 10 0	7 10 0
1312	1	Huntly	1 0 0	7 10 0	1 5 0
250	5	Inverary	5 0 0	10 0 0	6 12 6
425	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness G.&Wr.*	10 0 0	7 0 0	14 0 0
2400	5	Do., new shares	1 5 0	7 0 0	2 0 0
	10	Irvine	10 0 0	10 0 0	14 0 0
	2½	Do.	2 10 0	10 0 0	3 12 6
300	5	Jedburgh	5 0 0	7 10 0	7 10 0
		Johnstone, Paisley			
		Keith			
600	5	Kelso	5 0 0	10 0 0	10 10 0
620	2	Kelsyth	2 0 0	5 0 0	2 0 0
		Kennoway			
600	25	Kilmarnock	25 0 0	7 10 0	30 0 0
600	25	Do., new shares	7 10 0	7 10 0	
334	5	Kincardine	5 0 0	5 0 0	4 10 0
		Kinghorn			
		Kingskettle, Fife			
		Kinross			
1200	5	Kircaldy	5 0 0	10 0 0	10 10 0
320	5	Kircudbright	5 0 0	5 0 0	5 0 0
997	3	Kirkintulloch, nr. Glasgow	3 0 0	6 13 4	3 7 0
		Kirkwall			
		Kirriemuir			
		Lanark			
		Largo, near Leven			
280	8	Largs	8 0 0	7 10 0	8 10 0
1309	1	Lasswade, near Edinburgh	1 0 0		
177	5	Lauder	5 0 0	5 0 0	5 0 0
2000	1	Leslie, Fife	1 0 0	7 10 0	1 5 0
618	1	Lesmahago	1 0 0	6 0 0	1 0 0
		Leuchars			
1800	1	Leven	1 0 0	7 10 0	23s. to 25s.
100	10	Linlithgow	10 0 0	10 0 0	19 0 0
		Linton			
		Lochee, n. Dundee			
434	5	Lochgilphead(Ld.)	5 0 0	7 0 0	5 10 0
380	5	Lochwinnoch, nr. Paisley	5 0 0	3 10 0	4 0 0
1200	1	Markinch, Paisley	1 0 0	8 0 0	1 5 0
		Maryhill, n.Glasg.			
282	3	Mauchline	3 0 0	5 0 0	3 0 0
		Maxwell Town, n. Dumfries			
423	5	Maybole, Ayrshire	5 0 0	4 10 0	5 0 0
373	2	Melrose	2 0 0	7 10 0	2 10 0
718	2	Mid & East Calder	2 0 0		2 0 0
200	5	Moffat	5 0 0	5 0 0	
120	2½	Do.	2 10 0	5 0 0	
400	20	Montrose	20 0 0	10 0 0	35 0 0
800	5	Musselburgh	5 0 0	10 0 0	9 10 0
618	1	Nairne	1 0 0	5 0 0	1 0 0
		Neilston, n. Glasg.			
300	5	Newburgh, Fife	5 0 0	8 0 0	7 0 0
300	1	Do., new shares	1 0 0	8 0 0	
1200	1	Newmilns, near Kilmarnock	1 0 0	7 10 0	1 2 0
		Newton-on-Ayre			
107	14½	Newton Stewart	14 10 0	5 0 0	14 10 0
300	5	N. Berwick, N.B.	5 0 0	5 0 0	7 10 0
		N. Queensferry			
245	5	Oban	5 0 0	7 10 0	5 7 6
1000	5	Peebles	5 0 0	6 0 0	5 0 0
500	2½	Do.	2 10 0	6 0 0	2 10 0
1000	25	Perth	25 0 0	6 10 0	30 0 0
3000	5	Perth, New	5 0 0	6 0 0	5 10 0
		Peterhead			
2000	1	Pettenween	1 0 0	6 0 0	1 1 0
2416	1	Pollokshaws, near Glasgow	1 0 0	7 10 0	1 5 0
		Port Glasgow			
		Portobello, near Edinburgh			
200	5	Prestonpans	5 0 0	6 0 0	
1500	1¼	Rutherglen	1 6 8	5 0 0	1 6 8
250	12	St. Andrew's	12 0 0	6 5 0	16 0 0
193	12	Do., new	12 0 0	6 5 0	16 0 0
400	5	Saltcoats	5 0 0	7 10 0	6 0 0
936	1	Sanquhar	1 0 0	5 0 0	0 15 0
30	1	Do., preference	1 0 0	5 0 0	
		Selkirk			
		South Queensferry			
200	5	Stewarton	5 0 0	10 0 0	6 to 6½
7450	2	Stirling	2 0 0	8 0 0	3 12 0
2500	1	Stonehaven	1 0 0	6 5 0	1 5 0
1110	1	Stonehouse, Lanarkshire	1 0 0	7 10 0	13s. to 15s.
600	2½	Stornoway	2 10 0		2 10 0
500	5	Stranraer	5 0 0	7 10 0	6 0 0
588	2	Strathaven	2 0 0	8 0 0	3 0 0
643	2½	Thurso	2 10 0		2 10 0
		Tillicoultry, near Alloa			
800	1	Tranent	1 0 0	5 0 0	1 0 0
		Troon			
		Tullibody			
2051	1	Wemyss & Buckhaven	1 0 0	6 0 0	1 0 0
		Wick			
665	5	Wigtown	5 0 0		
		IRELAND.			
1800	1	Antrim (Limited)	1 0 0		1 0 0
		Ardee			
300	10	Armagh	10 0 0	10 0 0	19 to 20
500	5	Athy (Limited)	4 0 0	6 0 0	5 0 0
		Ballycastle			
600	5	Ballymena	5 0 0	15 0 0	5 10 0
184	10	Ballymoney	10 0 0	5 0 0	10 0 0
220	5	Ballynahinch(Ld.)	5 0 0	5 0 0	5 0 0
		Bangor, Down			
700	80	*Belfast*	80 0 0	10 0 0	100 0 0
	20	Do., new shares	20 0 0	10 0 0	25 0 0
1055	5	Carlow	5 0 0	5 0 0	5 0 0
600	5	Carrickfergus(Ld.	5 0 0	8 0 0	6 5 0
197	10	Carrickmacross(L.	10 0 0	5 0 0	10 0 0
		Carrick-on-Suir			
228	10	Castleblaney (Ld.)	10 0 0	5 0 0	10 0 0
400		Cavan (Limited)	5 0 0		
1300	5	Clonmel Consmrs.	5 0 0	5 0 0	5 0 0
240	5	Comber (Limited)	5 0 0	5 0 0	5 0 0
500	5	Cookstown	5 0 0	5 0 0	
		Coote Hill			
8000	5	Cork Consumers' (Limited)	5 0 0	6 10 0	7 0 0
4000	5	Do., new shares	1 5 0	6 10 0	2 0 0
608	11	Drogheda	11 0 0	7 0 0	14 10 0
420	5½	Do., new shares	5 10 0	7 0 0	7 5 0
		Dublin Hibernian (*see* Untd. Gen.)			
19000	10	*Dublin Alliance*	7 0 0	8 4 2	9¾ to 9½
220	25	Dundalk (Limited)	25 0 0	5 0 0	25 0 0
200	10	Dungannon	10 0 0	7 10 0	12 10 0
871	5	*Downpatrick*	5 0 0	4 0 0	4 0 0
249	10	Ennis (Limited)	10 0 0		11 0 0
240	25	Galway	25 0 0	10 0 0	35 0 0
		Keady			
400	10	Kilkenny (Limited)	10 0 0	7 0 0	11 0 0
		Kilrush			
210	10	Larne (Limited)	10 0 0	5 0 0	10 0 0
150	10	Letterkenny (Ld.)	10 0 0		12 10 0
1725	5	Limerick	5 0 0		
500	10	Lisburn (Limited)	8 0 0	10 0 0	10 0 0
300	5	Lismore	5 0 0	3 0 0	
100	5	Do., preference	3 0 0	5 0 0	
600	15	Londonderry	15 0 0	6 13 4	21 0 0
		Longford			
520	10	Lurgan	7 0 0	6 0 0	7 0 0
		Mallow			
2191	1	Maryborough(Ld.)	0 5 0		0 5 0
		Midleton			
		Monaghan			
		Navan			
		Nenagh			
1000	5	Newry Consumers' (Limited)	5 0 0		7¼ to 7½
450	5	Newtownards	5 0 0	7 0 0	6 5 0
200	10	Newtownlimavady	10 0 0	5 0 0	10 0 0
		Omagh	5 0 0	7 10 0	6 0 0
500	5	Portadown	20 0 0	5 0 0	21 0 0
125	20	Portaferry			
		Queenstown	10 0 0	5 0 0	
500	10	Sligo	10 0 0	6 0 0	10 0 0
900	10	Tullamore			
1600	10	*Waterford*	10 0 0	6 0 0	12 0 0
300	10	Wicklow (Lim.)	10 0 0	5 0 0	10 0 0

The Gas-Works in the undermentioned towns belong to private individuals. Those marked * by the purchase of the shares in extinct companies :—

Abergavenny.	Brough.	Ellesmere.	Halstead.	Littleborough.	Penryn.	Stowmarket.
Alford.	Bungay.	Ely.	Harleston.	Lynn.	Peterborough.	Thirsk.
Barking*.	Burntisland.	Enniscorthy.	Harrow-on-the-Hill.	Market Deeping.	Pontypool.	Tipperary.
Beaufort (Brecon).	Chapel-en-le-Frith.	Falmouth.	Hayle.	Nettlebed.	Redditch.	Tiverton*.
Billericay. [castle.	Chard.	Farsley.	Holbeach.	Newport* (I.W.).	Rhyl.	Waltham Abbey.
Blaydon, near New-	Clare.	Fermoy.	Holt.	Newport (I.W.), New.	St. Ives* (Hunts).	Wem.
Bodmin.	Crewe.	Ferry Hill.	Hunmanby.	New Ross.	Sidmouth.	Wexford.
Boroughbridge.	Crewkerne.	Fleetwood.	Kings Langley.	Oakham*.	Sittingbourne.	Whitchurch (Salop).
Bridgenorth.	Crickhowell.	Goole.	Knutsford.	Oswestry.	Spalding.	Whitby. [Howdon.
Broadbottom.	Dingwall.	Hadleigh.	Leiston (Suffolk).	Parsonstown.	Stokesley.	Willington Quay &

The Gas-Works belong to Municipal Corporations, or to Commissioners acting under special Acts of Parliament, in the following towns :—

Athlone.	Carlisle.	Great Malvern.	Limerick Corporation Works.	Oldham.	Salford.	Tralee.
Ballinasloe.	Cashel.	Greenock.	Lytham (Lanc.).	Paisley.	Southport.	Trim (Meath).
Beverley.	Coleraine.	Halifax.	Manchester.	Renfrew.	Stockton-on-Tees.	Wallasey.
Birkenhead.	Dalton.	Haverfordwest.	Middlesborough.	Richmond (York).	Stockport.	Walsall.
Blackpool.	Darlington.	Keighley.	Milton (Kent).	Rochdale.	Strabane.	Wells (Norfolk).
Burnley.	Devizes.	Kells (Meath).	Newton (Lanc.).	Ross.	Teignmouth.	Workington.
Burton-on-Trent.	Doncaster.	Knaresborough.		Rothesay.	Tenby.	Youghall.
Bury (Lanc.).	Enniskillen.	Leek.				

Share List of Water Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
			£ s d	£ s d	£ s d
1050	10	Accrington Gas and Water	10 0 0		15 0 0
1050	10	Do., new shares	10 0 0		15 0 0
2100	5	Do., do.	5 0 0		7 10 0
2100	5	Do., do.	5 0 0		7 10 0
2100	2½	Do., do.	0 10 0		0 15 0
		Airdrie and Coatbridge			
588	1	Alexandria	1 0 0		0 2 6
800	25	Ayr	25 0 0	5 0 0	25 0 0
		Banbury			
2150	10	Bangor	10 0 0	5 0 0	10 0 0
		Belper			
4800	25	Birmingham	25 0 0	6 0 0	39 0 0
4800	25	Do., new shares	22 10 0	6 0 0	33 15 0
710	10	Beccles Gas and Water	10 0 0	2 10 0	
		Blackburn			
		Boston			
		Brighton, Hove and Preston			
8000	25	Bristol	25 0 0	1 8 0	13¾ to 14½
		Do., preference			¼ to 1 pm.
		Broadstairs		4 0 0	
		Brompton and Gillingham			
5000	10	Bury and Radcliffe	10 0 0	2 0 0	10 0 0
1333	15	Do., pref. shares	15 0 0	10 0 0	31 15 0
1333	18	Do., do.	6 0 0	10 0 0	14 0 0
2000	10	Do., do.	5 0 0	4 0 0	5 0 0
2000	10	Do., do.	1 0 0	4 0 0	5 0 0
		Cambridge			
240	50	Canterbury Gas and Water	50 0 0	6 0 0	52 to 60
240	25	Do., new shares	25 0 0	6 0 0	25 to 30
240	12½	Do., do.	12 10 0	6 0 0	12½ to 15
240	6½	Do., do.	6 5 0	6 0 0	6½ to 7½
1500	20	Cardiff	20 0 0	7 10 0	29 to 31
1500	10	Do.	10 0 0	7 10 0	14½ to 15
	10	Carlisle	10 0 0		13 to 14
		Cheltenham			
		Chepstow			
		Chester			
19200	Sk.	Chesterfield Gas and Water		5 0 0	
400	50	Do., shares	50 0 0	5 0 0	52 0 0
		Colchester			
175	20	Colne	20 0 0	5 0 0	28 0 0
		Consett			
		Dartford			
1250	20	Darwen	20 0 0	2 10 0	19 to 19½
1400	5	Deal	5 0 0	5 0 0	5 0 0
1481	25	Derby	25 0 0	7 10 0	50 0 0
400	50	Dudley	50 0 0	1 0 0	20 0 0
250	25	Do., pref. shares	25 0 0	4 10 0	
		Dukinfield			
11600	10	Dundee	10 0 0	5 0 0	11 0 0
2670	5	Dunfermline	5 0 0	2 0 0	2 10 0
	5	Durham	5 0 0		
7360	25	Edinburgh	25 0 0	5 0 0	28 0 0
7360	12½	Do., new shares	12 10 0	5 10 0	16 0 0
7218	6¼	Do., do. quarter shares	6 5 0	5 0 0	7 0 0
5581	6¼	Do., do. do.	2 10 0	5 0 0	2 15 0
2000	25	Exeter	25 0 0	6 10 0	42 0 0
		Falmouth			
		Folkestone			
	20	Gravesend and Milton	20 0 0	3 0 0	14 to 16
1000	5	Greenock (Shaw's Gravitation)	50 0 0	7 0 0	68 to 70
		Guiseley, n. Leeds			
6800	5	Hartlepool Gas and Water	5 0 0	7 0 0	
3322		Do., new shares	5 0 0	7 0 0	
9878	5	Do., do.	1 10 0	7 0 0	
		Harrowgate			
		Heywood			
1200	10	Inverness Gas and Water	10 0 0	7 0 0	14 0 0
2400	5	Do., new shares	1 5 0	7 0 0	2 0 0
1842	10	Kendal Union Gas and Water	9 0 0	6 5 0	12½ to 13½
380	20	Do., preference	20 0 0	7 10 0	35 0 0
1500	10	Kilmarnock	10 0 0	2 0 0	8 0 0
3200	25	Leicester	25 0 0	4 10 0	27 10 0
120	25	Lewes	25 0 0	6 0 0	26 0 0
		Limerick			
720	25	Lincoln	25 0 0	5 5 0	30 10 0
200	25	Do., new shares	25 0 0	4 5 0	26 0 0
		Llandudno Gas and Water			
		London Comps.—			
47000	10	Berlin	10 0 0		5 to 5½
	25	Chelsea	25 0 0	4 0 0	21 to 23
	25	Do., new shares	25 0 0	4 10 0	23½ to 24½
975000	Sk.	East London	Stock	6 0 0	124 to 126
8000	50	Grand Junction	50 0 0	7 10 0	73 to 75
5840	25	Do., half shares	25 0 0	7 10 0	35 to 37
2310	100	Kent	100 0 0	5 0 0	100 to 102
1460	100	Lambeth	100 0 0	5 0 0	103 to 106
4120	50	Do., new shares	50 0 0	5 0 0	51¼ to 53
		New River		441 6 8	£17,400
1560	100	New River London Bridge Annuities	100 0 0	2 10 0	55 0 0
3036	100	Southwark and Vauxhall	100 0 0	5 10 0	109 to 111
3036	25	Do., do.	25 0 0	5 0 0	27 10 0
1265	100	Do., do.	10 0 0	5 0 0	
11064	61	West Middlesex	61 0 0	5 0 0 per sh.	103 to 105
1536	50	Liskeard			
2500	10	Lowestoft Gas and Water			
		Maidstone			
		Margate			
		Matlock			
650	5	Mold Gas and Water	5 0 0	7 10 0	6½ to 6¾
700	10	Monmouth Gas and Water	10 0 0	5 0 0	10 0 0
25000	Sk.	Newcastle-on-Tyne (Whittle Dean)	Stock	5 0 0	102 0 0
9600	6½	Do., do.	5 0 0	5 0 0	1 7 6
135	20	Newport, Carlisbrooke	20 0 0	4 10 0	26 0 0
	10	Newport, Mon.	10 0 0		9 to 10
		North Shields			
		Norwich			
3600	50	Nottingham	50 0 0	5 0 0	60 10 0
8000	10	Portsmouth	10 0 0	5 0 0	11 7 6
1500	10	Ramsgate	10 0 0	6 0 0	13 to 13½
		Reading			
		Richmond, Surrey			
		Rochdale			
		St. Helen's			
		Scarborough			
		Sheffield			
		Shrewsbury			
11184	10	South Staffordsh.	10 0 0		9 12 6
2554	10	Do.	5 0 0		
		Spalding			
21000	5	Staffordshire Potteries	5 0 0	6 0 0	7 5 0
		Staines			
1800	12½	Stockton and Middlesborough	12 10 0	6 0 0	
800	12½	Do., A shares	12 10 0	6 0 0	
1591	12½	Do., B shares	7 0 0	6 0 0	
4000	10	Do., C preference	2 0 0	5 0 0	2¾ to 3
21800	5	Sunderland and South Shields	5 0 0	8 0 0	8 2 6
		Tolcross, Lanark			
		Wakefield			
		Warrington			
		Wellington			
		Weston-sup-Mare			
		Weymouth			
		Widnes Gas & W.			
		Wigan			
		Winchester			
		Wirral, Cheshire			
		Wolverhampton			
20000	5	Wolverhampton New Co.	5 0 0	4 0 0	5 0 0
6000	10	York New Co.	10 0 0	5 0 0	11 12 6

The Water-Works in the undermentioned towns belong to private individuals :—

Campbelltown. Chidwall (Lancaster). Hastings, West (Eversfield Estate). Hyde (Cheshire). Ollerset (Derby). St. Leonard's. Stamford. Tunbridge Wells.

The Water-Works belong to Local Boards of Health, or to Municipal Corporations, or to Commissioners acting under Special Acts of Parliament, in the following towns :—

Aberdeen.	Bradford.	Dublin.	Hull.	Lytham.	Perth.	Stirling.
Abergavenny.	Burnley.	Dumfries.	King's Lynn.	Macclesfield.	Peterhead.	Stockport.
Aberystwith.	Carmarthen.	East Stonehouse.	Keighley.	Maidstone.	Pontefract.	Swansea.
Ashton-under-Lyne.	Chorley,	Glasgow.	Kirkcaldy.	Manchester.	Poole.	Teignmouth.
Barnsley.	Cork.	Gloucester.	Leamington.	Montrose.	Port Glasgow.	Warwick.
Bath.	Coventry.	Halifax.	Leeds.	Oldham.	Preston.	Whitby.
Belfast.	Croydon.	Hastings, East.	Leek.	Oxford.	Rugby.	Whitehaven.
Birkenhead.	Darlington.	Haverfordwest.	Leith.	Paisley.	Salisbury.	Wirksworth.
Bolton.	Dover.	Huddersfield.	Liverpool.	Pembroke.	Southampton.	Worcester.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	3 5 0	2 12 6	2 12 6	3 0 0	3 5 0
1¼ and 2 inches Socket-Pipes	7 0 0	6 0 0	6 5 0	6 10 0	6 15 0
2½ and 3 ,, ,,	6 10 0	5 10 0	5 15 0	6 0 0	6 5 0
4 and 5 ,, ,,	6 0 0	5 0 0	5 5 0	5 10 0	5 15 0
6 in. and upwards ,,	5 15 0	4 15 0	5 0 0	5 5 0	5 10 0
Retorts, 1st fusion, hot blast	5 10 0	4 10 0	4 15 0	5 0 0	5 5 0
,, 2nd ,, cold ,,	6 10 0	5 5 0	5 10 0	6 0 0	6 5 0
Tank Plates, ⅜ thick and above	6 0 0	5 0 0	5 5 0	5 10 0	5 10 0

WROUGHT-IRON TUBING,

Subject to 40 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 ft., perft.	1 8	1 0	0 10	0 7	0 5	0 4½
,, ,, ,, 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-Pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
,, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Plain Sockets [Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Syphons, 2 quart	1 0	0 8	0 7	0 5	0 4	0 3
	15 0	14 0	13 6	13 0	12 0	—

COALS, per Ton.

Newcastle.—Unscreened.	6s. 9d.
Whitwell Primrose	
Medomsley, Eighton Moor, and Burnhope	7 0
Pelaw	7 3
New Pelton, Peareth, South Pelaw, Washington Hutton, and South Peareth	7 6
Pelton	7 9
Ramsay's Newcastle Cannel	16 0

Scotch Cannel.	45s. 0d.
Boghead, at Leith	
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
,, 2nd ,,	12 6
Lesmahago, at Glasgow	25 0
,, ,, Leith	27 6
Arniston	27 6
Wemyss	20 0
Knightswood	18 0
Pirnie	15 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton.	9s. 9d.
Chatham & Rochester	
Cork	12 6
Dover	10 0
Dublin	13 0
Exeter Quay	12 0
Folkestone	10 0
London (Pool)	9s. 9d. to 9 10
Lowestoft & Yarmouth	6 6
Lynn	—
Portsmouth	10 6
Plymouth	11 0
Ramsgate & Margate	10 0
Whitstable	9 6
Weymouth	11 0

Foreign.—Per Keel.	£11 0 0
Boulogne and Calais	
Barcelona	24 0 0
Bordeaux	15 0 0
Cadiz	15 0 0
Copenhagen	11 0 0
Dieppe	12 0 0
Genoa	28 0 0
Hamburg	11 0 0
Havre	13 5 0
Leghorn	23 0 0
Lisbon	17 0 0
Rotterdam	11 0 0
Stettin	16 0 0
Trieste & Venice	24 0 0

SUNDRIES.

Best Newcastle Fire-bricks	per 1000	50s. 0d.	
Cliff's Fire-bricks, at Wortley	per 1000	55 0	
Ingham's Fire-bricks, at Wortley	,,	55 0	
Fire-clay Retorts	per foot run,	5s. 6d. to 7 0	
Tough Cake Copper ... per ton	£102 10s.	Foreign Spelter	per ton £20 0 0
English Pig Lead ... ,,	21 5	English Block Tin ... ,,	136 0 0
Welch Bar Iron, in London ,,	6 12 6	Banca ... ,,	135 10 0
Tarred Rope Yarn	per cwt.	26s. 0d.	

NORTHERN MIDDLE LEVEL METROPOLITAN SEWER.—Tenders were opened for the completion of the Northern Middle Level Sewer Works at the meeting of the Metropolitan Board of Works on the 21st ulto.—The engineer reported that the estimate for the whole work in October, 1859, was £280,000. and the tender accepted, that of Mr. Rowe, was for the sum of £264,533. Work had been certified to the amount of £10,739. He anticipated that the tenders to be opened would be much higher than that of Mr. Rowe's, on account of the increased price of materials, &c. The tenders were as follows:—

Messrs. T. Brassey and Co.	£329,800
Mr. W. Dethick	335,000
Mr. E. Thirst	345,000
Mr. W. Webster	350,000
Mr. W. Hill	357,200
Mr. J. Diggles	363,000
M. Roland Brotherhood	346,500
Mr. J. Millichamp, for Mr. W. Moxon	322,575

The tender of Messrs. Brassey and Co. was accepted.

THE FRUITS OF ILL-JUDGED ECONOMY.—The business of the late Winchester Assizes was seriously interrupted by the improper management of the gas, being at one time turned on to such an extent as to cause the breaking of the glasses; and, on being moderated at the meter, was "turned out," leaving the court in darkness, and causing an escape of gas from the open jets. After the trial of a charge of forgery, the gas was turned up and down, and eventually "off." The constable, with a taper attached to a rod, endeavoured to relight it, when one of the burners emitted an immense flame. the lighting taking place with an explosion of such force as to put out the taper, all the burners at the same time being full on. Mr. Justice Byles was very justly indignant at this want of management, and called for the High Sheriff, who was not in court, observing that there was a great escape of gas from the open jets which filled the court, and might cause an explosion. He ordered the carriage to be immediately sent for, and said he would dispose of the case before him, and then adjourn the court. It was very disgraceful that a proper method was not adopted of lighting the court. He was told that on former occasions the gas was placed under the care of a party from the gas-works, which was attended with some little expense; now it was under the management of the police, who no doubt did their best—but from their inability to regulate it properly, public business was interrupted. He then ordered the Under Sheriff to have the court lighted with candles, which having been done, his lordship, at the solicitation of counsel, consented to try the case, and at its conclusion adjourned the court.

DEFICIENT SUPPLY OF GAS IN BANBURY.—On the Sale of Gas Act being brought forward at the last quarterly meeting of the Banbury Town council, and as usual adjourned, some incidental discussion ensued upon the deficient supply of gas in this borough both to public and private lamps. Alderman Draper suggested that Mr. Beere, as chairman of the Board of Health, should convey to that body the complaints of the town that the lamps frequently gave no more light than rushlights. The Mayor said there must be something wrong. In his shop there were eighteen lights; and, upon the extinction of those lights at closing, he ought to have more light in his parlour, whereas they were sometimes obliged to burn candles. The Town-Clerk also complained of the deficiency, instancing in proof the miserable modicum of light in the Red Lion dining-room on the occasion of the late volunteer dinner. Alderman Goffe said there would be a meeting of the gas company the next evening, when any complaints might be made. Councillor Caless asked if the weather might not have something to do with it? Councillor Beere believed the evil was caused by there not being pressure enough. Councillor Grimbly thought it might be the fault of the fittings. In his own case, he had just had the old fittings taken down, and found the pipes corroded. He found, with the new pipes, he had now abundance of light. Alderman Goffe said it was only reasonable that pipes which had been in use for years, would be corroded and stopped up like unswept chimneys. The Town-Clerk, in his own case, had sent for Mr. Hedley's man, who told him that his fittings were sufficient, and that it must be the fault of the gas people. The Mayor had heard other complaints, more particularly from Mr. Fowler, in reference to the darkness at the volunteer dinner. Alderman Draper meant his observations to apply, not so much to private as to the public lights. He had observed one public lamp burning no more brightly than a rushlight, while elsewhere there was a good light. Some further conversation ensued, but beyond a pretty general expression of dissatisfaction nothing was elicited, and no resolution was passed.—*Banbury Guardian*.

EXPLOSION OF GAS AT GLASGOW. The gas-meter at the South-Western Station at Glasgow would not work in consequence of intense frost on Monday and Tuesday, and caused the railway authorities to communicate on Tuesday evening with the City of Glasgow Gas Company, who thereupon sent a man to remove the meter and connect the railway pipes with the company's main. This was immediately done; but next morning several parties about the station felt a very strong smell of gas, apparently coming from the gas-vault or cellar. A gas-fitter was sent for, and he proceeded below to discover what was wrong. No sooner did he open the cellar door than a dense body of gas rushed out, caught light at a jet a few yards distant, and exploded with a report which was heard more than 1000 yards off, and shook houses at 400 or 500 yards distance, awaking the sleepers. The gas-fitter was much burned about the face and hands, but had a most miraculous escape from being killed. Just at the time of the explosion, the Greenock express-train was about to start, and, most fortunately, all the passengers, with the exception of one, had received their tickets, and were seated in the train waiting its departure. After knocking down the substantial arched walls of the gas-cellar, and also those of the coal-cellar, the great volume of gas, proceeding upwards, dashed up a large portion of the flooring of the booking-office, singeing the hair of the clerk, carrying the passenger literally off his feet, and placing him outside the door without injury. The porter who stands at the bottom of the first-class stair had his leg broken, and a policeman was also slightly injured. The current of gas then rushed through the left luggage-room, at the South-east end of the first-class stair, blowing the whole of the room, which was only a temporary erection, to pieces. It then dashed to the ground a huge iron gate at the left, of about three tons weight, which has been sadly injured; and next, proceeded up the recently-erected gangway between the luggage-room and the platform of the station, spreading destruction as it went. The gangway itself was greatly broken up, and the roof torn off. At the head of the gangway, after knocking the door in pieces, the current seems to have exhausted itself in that direction, as it did no more damage there.

Advertisements.

JOSEPH CLIFF and SON,
FIRE-CLAY WORKS,
WEST DENTON, NEWCASTLE-ON-TYNE,
Manufacturers of Clay Retorts, Fire-Bricks, Lumps, Tiles, &c.
The seam of Clay from which these goods are made is noted for its fire-resisting properties. Prices very moderate.
Office, 52, Quay Side, Newcastle-on-Tyne.

THOMAS W. ALLSOPP,
GAS ENGINEER AND CONTRACTOR.
CASTLE DONINGTON, NEAR DERBY,
Manufacturer of every description of
Gas Apparatus, Gasholders, Boilers, &c.

EIGHTON MOOR GAS COALS.—Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay Goods.

WALTER MABON, Engineer,
ARDWICK IRON WORKS, FAIRFIELD STREET
MANCHESTER,
Manufacturer of
IRON TANKS for Gasholders, Railway Stations, &c.
GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.
GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.
WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.
IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.
PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

GEORGE BOWER,
GAS ENGINEER, MANUFACTURER,
AND CONTRACTOR,
ST. NEOT'S, HUNTS.
References to between 100 and 200 Gas-Works Designed and Erected by the Advertiser.

GEORGE CUTLER & CO.,
GAS ENGINEERS, &c.,
London Gasholder and Boiler Works,
8, WHARF, WENLOCK ROAD, CITY ROAD, N.,
LONDON.

Rye, Nov. 12, 1860.
Dear Sirs,—I consider it incumbent on me to acquaint you that the alterations recently made on the Rye Gas-Works—viz., the addition of a NEWLY-IMPROVED WASHER, and other work for the Purification of Gas, executed by the experienced workmen under your able supervision—are perfectly satisfactory to the Company, and the Gas is now as pure as it can be made.
I am, dear Sirs, your obedient servant,
CHARLES THOMAS, Superintendent,
Rye Gas-Works.
Messrs. Cutler and Co.

WIGAN Gas Cannel and Coals, also
SCOTCH BOGHEAD AND PIRNIE, for Manufacturing Gas and Oils.
Analyses, and other particulars supplied on application to
EMANUEL TURNER and CO.,
EXPORT COAL OFFICES, &c.,
34, CASTLE STREET, LIVERPOOL.

COUNTY and General Gas Consumers
COMPANY (LIMITED).—Works at Chertsey, Lea Bridge, Northfleet, Pembroke, Pembroke Dock, Ware, and Walton-on-Thames, producing a gas rental of about £6500 per annum.
Established for the erection of gas-works in provincial towns, or the purchase or leasing of existing works on equitable terms. Application to be made to the Engineer to the Company, Mr. H. P. STEPHENSON, 58, PALL MALL.

SAMUEL CUTLER, Gasholder
MAKER and CONTRACTOR
For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.
PROVIDENCE IRON WORKS,
MILL WALL, POPLAR. LONDON, E.
Main Laying and Gas-Works erected complete.

WILLIAM STEPHENSON & SONS
THROCKLEY,
NEWCASTLE-ON-TYNE,
MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE BRICKS, CLAY RETORTS, LUMPS, TILES,
&c. &c.
LONDON OFFICES:
76, KING WILLIAM STREET, CITY.
A large stock of Fire-Clay Goods always on hand in London, at the lowest wharf prices, at Messrs CHRISTIE & Co.'s Wharf, 64, Bankside, SOUTHWARK.

WEST and GREGSON, Gas-Meter
MANUFACTURERS, &c.
UNION STREET, OLDHAM.
Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.
W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

ROBERT MACLAREN and CO.,
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

FRENCH PATENT FOR SALE.
WALCOTT'S PATENT GAS
RETORT.
OFFICE: 24, ARCHURCH LANE, LONDON, E.C.

ADVANTAGES:
The whole of the Furnace Fire is used, none being lost by reverse sides of flues or against covering arch of oven or backwall in short bed, which is not even required. The construction of the Retort is durable with great strength—an arrangement whereby any carbon encrusting inside of Retorts is easily removed.
The patent method admits of a six-bed being converted into a three-bed in a few minutes whilst working, by using a few dry bricks to cut off the Fire from the other three, which can be then let down. A nine-bed can be converted to a six or a three, &c. Fire Goods at Stourbridge for a bed of six Retorts, size 8 ft. long, 18 in. wide, by 13 in. deep; between side walls (common brick), 4 ft. 10 in.; from back to front of stack, 8 ft. only; about £30. Cost of erecting somewhat similar to common Clay Retort setting, a three-bed, £15, and other sizes in a similar proportion. Retorts D, Oval, or Circular shaped.
Now working at the Banbury Gas-Works, OXFORDSHIRE, also St. Ives Gas-Works, HUNTINGDONSHIRE.

PERRENS & HARRISON,

THE LYE FIRE-CLAY AND BRICK-WORKS, STOURBRIDGE,

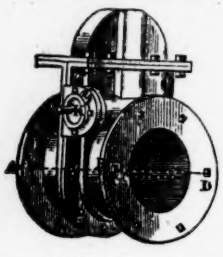
Successors to the late firm of J. and W. KING,

and Sole Proprietors of their well-known CLAY MINES, are prepared to supply

GAS-RETORTS, CLIFT'S PATENT GAS-OVENS and FIRE-BRICKS

OF ALL DESCRIPTIONS,

the superior quality of which will, they are confident, secure them further orders.



BRYAN DONKIN & CO.

keep always on stock their

IMPROVED GAS VALVES

from 2 inches to 18 inches, price 11s. 6d. to 13s. 6d. per inch diameter

List of prices, with full dimensions of all sizes up to 27 inches, to be had on application.

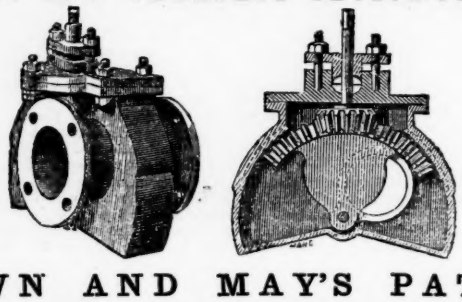
These Valves are all proved to 30 lbs. on the square inch before leaving the works.

BRYAN DONKIN & CO.,

ENGINEERS,

NEAR GRANGE ROAD, BERMONDSEY.

BEST AND CHEAPEST SLUICE-COCK.



BROWN AND MAY'S PATENT.

Above 3-inch diameter, price 10s. per inch. Brass face, 6d. per inch extra.

Can be taken to pieces without being removed from the line of Piping.

NORTH WILTS FOUNDRY, DEVIZES.

Wholesale Agents, Messrs. S. and E. RANSOME, 31, Essex Street, Strand, E.C., Where a Sample may be seen.

WALTER FORD,

LATE

PADDON and FORD,

GAS-METER AND APPARATUS WORKS,

GRAY'S INN ROAD, LONDON.

MANUFACTURER OF WET AND DRY GAS-METERS, STATION-METERS, GOVERNORS, &c. &c.

A large number of **STATION-METERS,** up to 80,000 feet per hour (being by far the largest in use), and **GOVERNORS** for **MAINS,** up to 24 inches, have been constructed by Paddon and Ford. These Meters and Governors possess peculiar advantages as regards strength and freedom of action.

Sole Manufacturer of **PADDON'S PATENT STREET-LAMP REGULATORS,** for insuring any required consumption. These Regulators are in general and increasing use, and references can be given to Gas Companies who use them for every Lamp.

JOSEPH BOULTON,

28, BAGNIGGE WELLS ROAD, CLERKENWELL,

PATENTEE OF

DRY & IMPROVED WET GAS-METERS,

AND

GAS APPARATUS.

All Meters warranted to comply with the Act of Parliament.

F. & C. OSLER,

45, OXFORD STREET, LONDON;

Manufactory—Broad Street, Birmingham—Established 1807,

MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.

ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards (Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

JAMES OAKES and CO.,

ALFRETON IRON WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast Iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, Lamp Columns of various patterns, &c.

N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.

CHARLES HORSLEY, Agent.

C. H. is prepared to carry out the warming and ventilation of public buildings, &c.; also civil engineering in general.

BIRTLEY IRON WORKS,

CHESTER-LE-STREET, DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

JOHN ROGERSON and CO.,

NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

LONDON HOUSE:

12, ROYAL EXCHANGE BUILDINGS.

WROUGHT-IRON Guides for Gas-HOLDERS,

when Trussed upon scientific principles, are more capable of resisting strains, in every direction, than Cast Columns of any form can be; and weigh only one-fifth as much as the latter. Designs and Working Drawings for Guides and Ties can be obtained of the Inventor, CHARLES DIXON, C.E., Chichester, SUSSEX.

GAS COAL.

BEAL, WALKER, and CO., Coal and COKE MERCHANTS,

No. 1, Walker's Buildings, SHEFFIELD, beg to inform the Directors and Managers of Gas Companies, that they are in a position to contract for the supply of the different sorts of best Gas Coal, such as best Silkstone, Barnsley, and others, at the lowest prices, which may be had on application at the above Office.

ALFRED PENNY, Gas and CONSULTING ENGINEER,

WENLOCK IRON WORKS,

21 & 22, WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.

Plans, Specifications, and Estimates prepared.

JOSEPH WILLCOCK

(late BARLOW and CO.),

Mechanical and Architectural Draftsman, Designer, Serveyor, an Lithographer to Gas Engineers and Gas Apparatus Manufacturers, formerly Superintending Engineer at the largest Gas Apparatus Manufactory on the Continent.

Patent and Designs Office, 89, Chancery Lane, LONDON, W.C.

GEORGE ANDERSON, Gas and CONSULTING ENGINEER,

104, LEADENHALL STREET, LONDON (E.C.).

DIRECT-ACTING GAS-EXHAUSTERS,

supplied either with or without Steam-Engines and Boilers.

FOUR-WAY DIAPHRAGM VALVES,

one of which answers the purpose of THREE ordinary Valves, as applied to Purifiers, or in shutting off and passing Station-Meters, Governors, or other apparatus, while the Connecting-Pipes are also much simplified.

RETORT SETTINGS,

designed to be heated by Tar alone, and with a total absence of Smoke.

Illustrated circulars, giving references and every information, may be obtained on application as above.

BENJAMIN GIBBONS, Jun., DEEPDALE FIRE-CLAY & BRICK WORKS,

Near DUDLEY,

Manufacturer of every description of Fire-Bricks, Lumps, Quarries, Shields, Flue Covers, &c., to any size or shape required.

FIRE-CLAY RETORTS,

TO MODEL OR DRAWING.

B. G. begs to call the attention of Gas Companies to his Fire-Clay Retorts, which have been used with great satisfaction in some of the largest Gas-Works in the Metropolis and many Provincial Towns in England.

References given, if required.

TO GAS COMPANIES.

STOKERS' GLOVES,

11s. per Dozen.

S. CARPENTER, 3, BOW COMMON.

TO GAS COMPANIES AND CONTRACTORS.

FOR Sale, several lengths of Hydraulic MAIN, 14 inches diameter and 6 feet 9 inches long, with 7 holes for DIP-PIPES.

Also 4-inch ASCENSION-PIPES, and 3-inch ARCH and DIP-PIPES, and RETORT MOUTHPIECES, all in excellent condition, and will be sold at a very low price, and delivered, if required, at any Railway Station in London.

To be seen, on application to the ENGINEER, at the Equitable Gas Company's Works, Lupus Street, PIMLICO.

LEONI'S Patent Adamas Gas- BURNERS (secured by Her Majesty's Royal Letters Patent), are entirely free from liability to CORROSION, injury from Heat, or danger of Fracture, and are UNALTERABLE in the dimensions of their Apertures.

Uniformity in the consumption of Gas is obtained by the process of manufacture, which ensures that the Burners shall be of precisely similar pattern.

The Adamas Burners are confidently recommended to Gas-Fitters, Consumers, and Companies.

Sole Manufacturer and Patentee in Great Britain, S. LEONI, Adamas Works, St. Paul Street, New North Road, LONDON, N.

WHITEHOUSE and CO., Boiler and GASHOLDER MAKERS,

GLOBE PATENT TUBE WORKS, WEDNESBURY,

Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

TO Mr. BENJAMIN WHITEHOUSE, GASHOLDER MAKER, WESTBROMWICH, NEAR BIRMINGHAM.

Sir,—I feel great pleasure in expressing my satisfaction at the manner in which you discharged your duties as CONTRACTOR for the TELESCOPIC GASHOLDER, 150 feet diameter and 60 feet deep, erected at this Company's Nine Elm Station in 1857. From that period to the present I have closely watched its working, and have never found the least defect either in workmanship or material.

During the recent heavy gales the Gasholder, although containing upwards of 1,000,000 cubic feet of Gas, showed no perceptible indications of its influence, but worked as freely and easily as usual.

RICHARD JONES.
Engineer to the London Gaslight Company.
Vauxhall, London, Nov. 9, 1859.

BELGIAN CLAY RETORTS.

ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Albert Keller, of Ghent, begs to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by him. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications, addressed to ALBERT KELLER, GHENT, will receive immediate attention.

M. SHEEN, Gas and Railway Lantern Maker, 90½, Holborn Hill, begs to inform Managers of Gas-Works, &c., that she continues to contract and supply Lanterns on reasonable terms, and keep them in repair by the year.

WILLIAM BLEWS AND SONS' IMPROVED MACHINE-MADE BURNERS, WROUGHT-IRON BATSWINGS, FOR RAILWAY STATIONS AND MARKETS, GAS-FITTINGS, CHANDELIERS, BRASS AND IRON TUBES OF EVERY KIND, SUPPLIED ON THE BEST TERMS, AT THE WORKS, 9, 10, 11, BARTHOLOMEW STREET, BIRMINGHAM.

JAMES NEWTON, (Established 1820,) **FIRE-BRICK AND TILE MERCHANT,** Wholesale and for Exportation, FALCON DOCK, 78 AND 79, BANKSIDE, SOUTHWARK, LONDON.

DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and CLAY, and every Article suitable for **GAS AND WATER WORKS.**

Gas Stoves, Gas Baths, Gas Cooking APPARATUS, warranted the best in England, at PHILLIPS's, the original inventor and manufacturer, and general gas-fitter, &c., 55, Skinner Street, Snow Hill, LONDON, E.C.

PATENT SAFETY ATLAS CHANDELIERS, Sun and Star Burners, Outside Lamps, Patent Reflecting Lamps, Portable Coppers for either Gas or Fuel. Iron Tube and Fittings. Best quality for Gas, Steam, or Hot Water, &c. &c.

HARRIS and PEARSON, PROPRIETORS OF BEST CLASS-HOUSE POT AND CRUCIBLE CLAY. MANUFACTURERS OF **FIRE BRICKS, GAS RETORTS, &c.** AMBLECOTE FIRE CLAY AND BRICK WORKS, STOURBRIDGE.

Late in the occupation of L. and W. King. Originally J. Pidcock, Esq.

NB. A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches, 16 inches. D's, 16×12, 15×14, 20×16, 16×18.

JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coalfields (the most extensive and valuable in the parish of Lesmahago), respectfully intimate to the Managers of Gas-Works and Consumers of Gas Coal, that they are prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas-Coal Works, Lesmahago.

Shipping Agent for Glasgow:
MR. ALEXANDER STRATTON,
159, WEST GEORGE STREET.

GAS PURIFYING BY REVIVIFIABLE OXIDE OF MANGANESE.

MR. LAMING (Inventor of the Revivified Oxide of Iron Purification) begs to inform Gas Engineers that they may now supersede the material in general use by A REVIVIFIABLE OXIDE OF MANGANESE of his preparing, which in efficacy is at least equal, and in economy superior, to Oxide of Iron. Owing to the greater chemical activity of Manganese, common dry-lime purifiers of ordinary capacity will often be amply sufficient for it, though they may be too small for the Oxide of Iron material.

For Gas-Works possessing steam power, more especially such as are exposed to public complaint, Mr. Laming recommends the purification to be done either wholly or in part (depending on extent of apparatus) in out-of-doors scrubbers, hermetically sealed, by means of his liquid process, which is both economical, and meets all practical requirements.

118, Fenchurch Street, Aug. 1, 1859.

CAUTION.

TO GAS-METER MANUFACTURERS AND OTHERS.

THE Undersigned hereby caution Meter Manufacturers and others against infringing the exclusive right of the Undersigned to the use of the Screw Adjustment for regulating the Height of the Overflow-Pipes in Wet Gas-Meters, as described in the Specification of the Letters Patent granted to Crosley and Goldsmith on the 19th of April, 1856; as well as against infringing any other portions of that or any other Patent of the said William Crosley; and

NOTICE is further given, that all Infringers of the said Inventions, or any portions of them, will be proceeded against. CROSLEY & CO.,
103, SOUTHWARK BRIDGE ROAD,
LONDON, Aug. 29, 1859.

EDWIN DIXON,

WOLVERHAMPTON PATENT WROUGHT-IRON TUBE WORKS,

Originally established in 1833,

Manufacturer of Gas and other Tubes, Fittings, and articles of every description belonging to Gas, Water, or Steam.

E. D. had the honour of receiving the

PRIZE MEDAL

awarded to this Manufacture by the COUNCIL of the GREAT ENGLISH EXHIBITION of 1851; and from he latter date has supplied many towns exclusively with GALVANIZED and other Tubes for Gas and Water, under GOVERNMENT ENGINEERS.

A City, containing 150,000 inhabitants,

has recently been entirely supplied with Tubes made at the above-named Works, and several others with populations nearly as great; in fact, the reputation now acquired induces this notice to the public.

Large Stocks generally on hand, averaging from one to three hundred thousand feet.

HYDRAULIC PRESS TUBES,

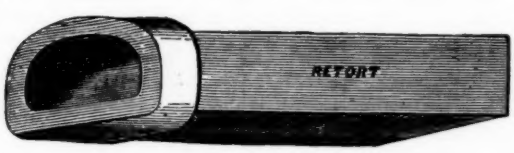
to resist 6000 lbs. and upwards to the square inch, extensively manufactured.

STOCK DIES and SCREWING TACKLE

of the best possible descripton.

Every Tube carefully tested with Hydraulic Pressure before leaving the Works.

KING BROTHERS, Stourbridge Fire-Brick and Retort Works.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Bars, Flues, and Quarries, are all Manufactured of the same quality of Clay.

Every Retort and Brick is branded "King Brothers, Stourbridge."

WILLIAM SUGG,

MANUFACTURER OF

PATENT DRY AND WATER GAS-METERS, TEST GASHOLDERS, AND APPARATUS,

"EVANS'S" PHOTOMETERS,

Experimental Meters, Minute Clocks, &c., Station Meters and Governors,

STREET-LAMP GOVERNORS AND LAVA BURNERS,

19 and 20, MARSHAM STREET, WESTMINSTER.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of
RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY,
beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.
The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.—Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

LIVESEY FIRE-CLAY WORKS,

NEAR BLACKBURN, LANCASHIRE.

ORLANDO BROTHERS,

MANUFACTURER OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

WILLIAM PARKINSON AND CO.,

(SUCCESSORS TO THE LATE SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

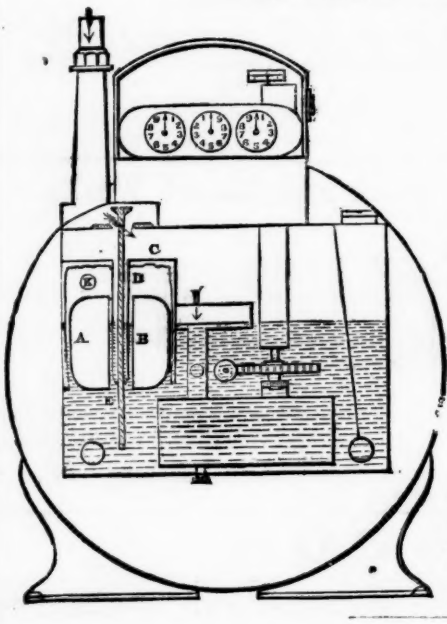
PATENTEES AND MANUFACTURERS OF

STATION-METERS & GOVERNORS,

CONSUMERS' METERS & GOVERNORS,

AND OTHER GAS APPARATUS. Also,

METERS FOR MEASURING WATER.



IMPROVED LOW-SPOUTED GAS-METER,

WITH

NEW PATENT FLOAT ARRANGEMENT.

The Float A is partitioned off from the front frame considerably below the water-line, and is pierced perpendicularly by a tube B.

A large gas-way, C, is left between the top of the partition and the valve-seat. The small tube D, in which the float-wire works, is fixed to the top of the partition, and comes down below the water-line inside the tube B. The float-wire is soldered to the float at E, so as to allow water to pass into the tube D, in order to seal it. The chamber above the float is open to the outlet through the hole K.

The action of this float is exactly opposite to that of ordinary meters. The float is elevated by sudden pressure, and the valve cannot be closed except through want of water.

W. P. and Co. beg especially to call the attention of Gas Companies and others to this New Patent Meter, which entirely overcomes the difficulty experienced by ordinary wet meters, owing to the short range of the float, which is necessary in order to meet the requirements of the "Sale of Gas Act."

They are prepared to supply

TEST GASHOLDERS,

of the most approved description, graduated by the Standard.

CROSLEY & GOLDSMITH'S

PATENT SELF-ADJUSTING & COMPENSATING GAS-METERS

CANNOT BE OVER OR UNDERCHARGED WITH WATER,

and they consequently register the quantity of Gas consumed with greater accuracy than Meters in which the Water-Line is variable.

MANUFACTURED BY

CROSLEY & CO.,

GAS-METER MANUFACTURERS,

103, SOUTHWARK BRIDGE ROAD, LONDON, S.E.

N.B. The Patent Self-Adjusting and Compensating Apparatus may be applied to the ordinary Meter.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENT METERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c., &c., similar to those used by Mr. King, of Liverpool.

CROSLEY & CO. are also prepared to supply Gas Companies and others with

DUPLICATES of Mr. KING'S CUBIC FOOT TRANSFERRER,

similar to that manufactured by them, and verified by the ASTRONOMER ROYAL, and PROFESSOR MILLER, of Cambridge, on behalf of the Government, which was deposited by C. & Co. in the Office of the COMPTROLLER-GENERAL of the EXCHEQUER before Nov. 13, 1859, in compliance with the "Act for Regulating Measures used in Sales of Gas." They also supply

TEST GASHOLDERS,

Graduated by the Standard Cubic Foot.

C. and Co. are the only house in the trade which has for years manufactured Meters according to the standard measure set forth in the 2nd Section of the "Sale of Gas Act," and which also comply with the rules laid down in the Section for testing meters. Purchasers of C. and Co.'s Meters may therefore be secured against any additional expenses being incurred in order to adapt their Meters to the requirements of the new Act.

FIRE-CLAY RETORTS.

JOHN SWARBRICK,

MANUFACTURER OF PATENT COMPOSITION CLAY RETORTS,

FIRE BRICKS OF EVERY DESCRIPTION, SHAPE, AND SIZE, &c. &c.

HIGHER EANAM, BLACKBURN, LANCASHIRE.

These RETORTS are generally used in the Gas-works of Preston, Accrington, Bury, Heywood, Middleton, Rochdale, Ratcliffe; the Mills of Messrs. Horrocks, Miller, and Co., Preston, &c. &c., and are unequalled in having afforded general satisfaction to those who have given these Retorts a trial.

To meet the increasing demand, the Works at Little Harwood have been greatly enlarged; and Gas Engineers who may favour with an Order may rely with confidence on their being promptly supplied with an article not to be surpassed in finish or durability.

PRICES MODERATE.

EDWARD COCKEY AND SONS' PATENT GAS VALVES.

These Valves are formed of two Cast-Iron Cylinders, with segmental divisions, having the faces ground gas-tight—the upper Cylinder turning horizontally on the lower one.

The lower Cylinder has pipes from each division, communicating with the vessels to and from which the gas is to be passed. The upper Cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and when it is turned on the face of the lower one, to alter the flow of gas from one vessel to another.

Many of these Valves are now in use on Gas-Works; and, amongst others, the following may be mentioned:—

CHELTENHAM GAS-WORKS.—A Valve for 2 Purifiers, with 9-inch Connexions.

NEWPORT, MONMOUTHSHIRE.—Valves for 3 Purifiers, with 12-inch Connexions.

BASINGSTOKE.—A Valve for 3 Purifiers, with 6-inch Connexions.

WARMINSTER.—A Valve for 2 Purifiers, with 6-inch Connexions, and Bye-pass Valve for Meter.

GODALMING.—A Valve for 3 Purifiers, with 5-inch Connexions.

RYDE, ISLE OF WIGHT.—A Bye-pass Valve for Exhauster, with 9-inch Connexions.

The Engineers of either of these Works have kindly allowed reference to be made to them.

IRON WORKS, FROME SELWOOD.

EDWARD COCKEY AND SONS

ALSO MANUFACTURE

PURIFIERS, SCRUBBERS, CONDENSERS, AND OTHER IMPROVED GAS APPARATUS,

HAVING PATTERNS SUITABLE FOR GAS-WORKS OF DIFFERENT SIZES.

SALE OF GAS ACT.

MESSRS. CROLL, RAIT, AND CO.,

Manufacturers of Croll's Patent Improved

DRY GAS-METER,

Also Manufacture and Supply

TEST GAS-HOLDERS,

And other Apparatus required by the Inspectors appointed in pursuance of the above Act.

Application for particulars to be made to the Factory,

CANAL BRIDGE, KINGSLAND ROAD, LONDON, N.E.

ALEXANDER WRIGHT,

55 and 55A, MILLBANK STREET, WESTMINSTER, S.W.,

MANUFACTURER OF

CONSUMERS' COMPENSATING & NON-COMPENSATING WET GAS-METERS,

Of the best material and workmanship, carefully adjusted to meet the requirements of the SALES OF GAS ACT.

STATION-METERS & GOVERNORS,

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